FLORA

OF

BRITISH INDIA.

Dates of Publication of the Several Parts of this Volume.

PART IV.	pp. 1–240,	was published	*May*	1876.
„ V.	pp. 241–496,	„	*July*	1878.
„ VI.	pp. 497 to end	„	*May*	1879.

1879
v. 2

THE

FLORA OF BRITISH INDIA.

BY

SIR J. D. HOOKER, C.B., K.C.S.I.

M.D., F.R.S., D.C.L. OXON., LL.D. CANTAB.

CORRESPONDING MEMBER OF THE INSTITUTE OF FRANCE, AND HON. MEMBER OF THE ASIATIC SOCIETY OF BENGAL.

ASSISTED BY VARIOUS BOTANISTS.

VOL. II.

SABIACEÆ TO CORNACEÆ.

PUBLISHED UNDER THE AUTHORITY OF THE SECRETARY OF STATE FOR INDIA IN COUNCIL.

Mo. Bot. Garden,
1896.

LONDON:
L. REEVE & CO., 5 HENRIETTA STREET, COVENT GARDEN.
1879.

LONDON: PRINTED BY
SPOTTISWOODE AND CO., NEW-STREET SQUARE
AND PARLIAMENT STREET

FLORA OF BRITISH INDIA.

Errata in Vol. II. Pt. III.

P. 404. Hydrangea *altissima* is a scandent tree (*J. D. H.*)
,, 413. Crassula *indica* has the stem-leaves alternate.
,, 415. Kalanchoe *brasiliensis* should include K. olivacea, *Dalz. in Dalz. & Gibs. Bomb. Fl.* 313.
,, 417, l. 3. Stamens 5 in some flowers, 10 in others (W. B. Hemsley).
,, 445. Terminalia *belerica* should include T. attenuata, *Edgw. in Trans. Linn. Soc.* xx. 46.
,, 585. Epilobium *Hookeri* published as E. trichoneurum, *Hauskn. in Oestr. Bot. Zeit.* 1879.
,, 607, l. 38, *under* T. multiloba, *in place of* only half-way down *read* very rarely only half-way down.
,, 622. Add Bryonia *dioica, Jacq.* collected in Lahul by Dr. Aitchison.
,, 631. *For* Thladiantha *dubia*, Bunge *read* T. calcarata, *C. B. Clarke in Journ. Linn. Soc.* xv. 126—(*Momordica calcarata, Colebr*). The Indian *T. calcarata* has fenestrate fruit, thus differing specifically from the Japanese *T. dubia*. The confusion has arisen under Bot. Mag. t. 5469, which represents the plant of *T. dubia* but the fruit of *T. calcarata* (Cogniaux).
,, 643. Begonia *fallax*. The type specimen of this species, lately found in Wight's private Herbarium, is B. malabarica, *Lamk.*
,, 705, l. 5. The Kumaon plant collected by Strachey and Winterbottom is *Trachydium Roylei*. Hence *Pleurospermum stellatum* is known (very imperfectly) only by the example of Royle. The plant described as Var. *Lindleyana* is a different species, but it is very doubtful whether it is the same as Royle's (W. B. Hemsley).

Hooker's Flora of India, Pt. VII.

1. **S. campanulata,** *Wall. in Roxb. Fl. Ind. ed. Carey*, ii. 311; *Cat.* 1002; leaves oblong acuminate puberulous base acute, petals elliptic nerved, filaments subulate much shorter than the petals. *Hook. f. & T. Fl. Ind.* i. 209; *Brandis, For. Flor.* 116.

Temperate Himalaya; from Simla, alt. 5000 ft., to Sikkim, alt. 9–10,000 ft.
A climbing shrub. *Leaves* 2–4 by $\frac{3}{4}$–$1\frac{1}{2}$ in., membranous, puberulous on both surfaces, nerves reticulate. *Peduncles* 1–2 in., subclavate. *Flowers* $\frac{3}{4}$ in. diam.,

FLORA OF BRITISH INDIA.

ORDER XLV. **SABIACEÆ.** (By J. D. Hooker.)

Climbing or erect shrubs or erect trees, glabrous or with simple hairs. *Leaves* alternate, exstipulate, simple or compound. *Flowers* small or minute, hermaphrodite or polygamous, usually panicled. *Calyx* 4–5-partite, imbricate. *Petals* 4–5, equal or unequal, opposite or alternate with the sepals, imbricate. *Disk* usually small, annular. *Stamens* 4–5, opposite the petals, inserted at the base of or on the disk, all perfect or two only perfect and three without anthers; filaments clavate, flattened or subulate; anthers didymous, cells distant bursting transversely or by a deciduous cap. *Ovary* 2–3-celled, compressed or 2–3-lobed; styles 2–3, free or connate or 0, stigmas punctiform; ovules 1–2 in each cell. *Ripe carpels* 1–2, dry or fleshy, indehiscent. *Seeds* compressed or globose, basilar, hilum broad, testa membranous or coriaceous, albumen 0; embryo various, cotyledons often contorted, radicle deflexed.—DISTRIB. A small chiefly Indian order, with 4 genera and about 35 species.

Stamens 4–5, all perfect and equal . . . . 1. SABIA.
Stamens 5, very unequal . . . . 2. MELIOSMA.

1. **SABIA,** Coleb.

Climbing or sarmentose shrubs; branches with the bud-scales persistent at their bases. *Leaves* quite entire. *Flowers* axillary, solitary, cymose or panicled, usually hermaphrodite, 2-bracteate; bracts, calyx, corolla, stamens and carpels all opposite. *Calyx* 4–5-partite. *Petals* 4–5, with transparent lines, green, purplish or yellow. *Disk* annular, 4–5-lobed. *Stamens* 4–5, inserted at the base of the disk; anthers extrorse or introrse. *Carpels* 2, rarely 3, cohering slightly; styles 2, erect, terminal, cohering slightly; ovules 2 in each carpel, collateral or superposed, horizontal. *Ripe-carpels* 1 or 2, gibbous, with a subbasal style, dry or drupaceous. *Seed* reniform, testa coriaceous, dotted; embryo curved, cotyledons straight or incurved flat rugose or undulate, radicle cylindric.—DISTRIB. About 10 species, natives of tropical and temperate India.

* *Peduncles 1-flowered.*

1. **S. campanulata,** *Wall. in Roxb. Fl. Ind. ed. Carey*, ii. 311; *Cat.* 1002; leaves oblong acuminate puberulous base acute, petals elliptic nerved, filaments subulate much shorter than the petals. *Hook. f. & T. Fl. Ind.* i. 209; *Brandis, For. Flor.* 116.

TEMPERATE HIMALAYA; from Simla, alt. 5000 ft., to Sikkim, alt. 9–10,000 ft.
A climbing shrub. *Leaves* 2–4 by $\frac{3}{4}$–1$\frac{1}{2}$ in., membranous, puberulous on both surfaces, nerves reticulate. *Peduncles* 1–2 in., subclavate. *Flowers* $\frac{3}{4}$ in. diam.,

subglobose or campanulate, green. *Sepals* orbicular. *Petals* $\frac{1}{3}$–$\frac{1}{2}$ long, enlarging and persistent after flowering. *Anthers* extrorse. *Drupes* $2\frac{1}{2}$ in., pale blue, orbicular, compressed.

2. **S. leptandra,** *Hook. f. & T. Fl. Ind.* i. 209; leaves elliptic or oblong acuminate glabrous base rounded, petals elliptic-oblong obtuse, filaments elongate.

SIKKIM HIMALAYA; alt. 5–7000, ft. *J. D. H.*

A shrub. *Leaves* thinly coriaceous, very variable in size and usually 3–4 by 1–$1\frac{3}{4}$ in., rarely 6 by 3 in., beautifully reticulated between the few oblique nerves. *Peduncles* 1–2 in. *Flowers* campanulate, greenish-purple. *Sepals* 5, rounded. *Petals* $\frac{1}{3}$ in. long, punctate. *Filaments* ligulate, anthers extrorse. *Drupe* as in *S. campanulata.*

* *Flowers in 5- or more-flowered cymes or panicles.*

3. **S. purpurea,** *Hook. f. & T. Fl. Ind.* i. 209; leaves oblong long-acuminate base usually rounded young puberulous, cymes 3–5-flowered, petals acute, filaments broadly subulate. S. parviflora, *Wall. Cat.* 1001, *in part.*

KHASIA MTS.; alt. 4–6000 ft. *Wallich*, etc.

Leaves 2–3 by $\frac{1}{3}$–1 in., often 6 by $2\frac{1}{2}$ in. on the flowerless branches, glabrous, thinly coriaceous; nerves oblique, uniting far within the margin. *Peduncles* long, irregularly branched. *Flowers* small, purplish. *Sepals* ovate, subacute. *Petals* ovate-lanceolate, 5-nerved. *Drupe* as in *S. campanulata.*

4. **S. malabarica,** *Bedd. Ic. Pl. Ind. Or.* t. 177; leaves elliptic-oblong acuminate margins waved base rounded, cymes very short 2–6-flowered, petals elliptic obtuse, filaments subulate.

WESTERN PENINSULA; Anamallay hills, alt. 3–4000 ft., *Beddome.*

A climbing shrub, quite glabrous. *Leaves* 3–5 by 1–$1\frac{3}{4}$ in., thinly coriaceous, pale, margin cartilaginous; nerves many, spreading, much reticulated beneath; petiole $\frac{1}{2}$–1 in. *Peduncle* $\frac{1}{4}$–$\frac{1}{2}$ in. *Flowers* $\frac{1}{10}$ in. diam. *Sepals* small, ovate, acute, ciliate. *Petals* glabrous. *Stamens* shorter than the petals. *Filaments* slender. *Anthers* didymous, cells diverging. *Ovules* subcollateral. *Drupe* $\frac{1}{2}$ in., reniform, reticulated.—Beddome figures the petals as connate at the base.

5. **S. parviflora,** *Wall. in Roxb. Fl. Ind. ed. Carey*, ii. 310; *Cat.* 1001, *in part*; leaves ovate or oblong acuminate margins waved, cymes dichotomous 7–11-flowered, stamens unequal. *Hook. f. & T. Fl. Ind.* i. 210.

SUBTROPICAL and TEMPERATE HIMALAYA; from Kumaon to Sikkim, alt. 3–6000 ft.

A climbing shrub; branches very slender, tips puberulous. *Leaves* 2–4 by $\frac{3}{4}$–$1\frac{1}{2}$ in., thinly coriaceous, glabrous, pale beneath, nerves almost horizontal. *Bracts* minute, ciliate. *Flowers* minute. *Sepals* ovate, ciliate. *Petals* narrowly oblong, 5-nerved. *Filaments* ligulate. *Drupe* $\frac{1}{3}$–$\frac{1}{2}$ in., obovoid, oblong or subglobose; stone compressed.

6. **S. lanceolata,** *Colebrooke in Trans. Linn. Soc.* xii. 355 t. 14; leaves oblong-lanceolate base acute or obtuse, cymes long-peduncled corymbose many-flowered, petals ovate-lanceolate, stamens included. *Wall. in Roxb. Fl. Ind. ed. Carey,* ii. 309; *Cat.* 999; *Blume Mus. Bot.* 368; *Hook. f. & T. Fl. Ind.* i. 210.

KHASIA MTS., SILHET and ASSAM, from the sea level to 4000 ft.

A climbing shrub. *Leaves* 4–7 by $1\frac{1}{4}$–$2\frac{1}{2}$ in., shining above, glaucous beneath, thinly coriaceous, nerves nearly horizontal, petiole $\frac{1}{4}$–$\frac{1}{2}$ in. *Peduncles* $1\frac{1}{2}$–2 in., slender, sometimes supra-axillary. *Flowers* greenish, sweet-scented. *Sepals* ovate, acute. *Petals* $\frac{1}{8}$ in., subacute. *Filaments* subulate. *Anthers* introrse. *Drupe* $\frac{2}{3}$ in., pulpy, blue; stone rugose, compressed.

7. **S. limoniacea,** *Wall. Cat.* 1000; leaves oblong or lanceolate acute or acuminate thickly coriaceous, panicles long glabrous, petals broadly oblong, stamens included. *Hook. f. & T. Fl. Ind.* i. 210. Celastrinea, *Wall. Cat.* 9015; *Griff. Notul.* iv. 423; *Ic. Pl. As.* t. 568 f. 2.

TROPICAL SIKKIM, BHOTAN, and the KHASIA MTS., ascending to 3000 ft.; SILHET, ASSAM and CHITTAGONG.

A lofty climber. *Leaves* 3–7 by $1\frac{1}{4}$–$2\frac{1}{2}$ in., base rounded or acute, much reticulate when dry; nerves oblique, incurved. *Panicles* reddish, quite glabrous, axillary or a little supra-axillary, with persistent bud-scales at their bases. *Flowers* minute, yellowish. *Sepals* orbicular. *Petals* $\frac{1}{10}$ in., shortly clawed, obovate, 5-nerved, fleshy. *Filaments* fleshy, incurved.—This approaches the Javanese *S. menescorta*, Bl.

8. **S. paniculata,** *Edgw. in Hook. f. & T. Fl. Ind.* i. 211; branches glabrous, leaves elliptic- or oblong-lanceolate acute coriaceous base rounded or acute, panicles long pilose, petals oblong, stamens included. *Brandis For. Flor.* 117.

Subtropical WESTERN HIMALAYA; in Kumaon and Garwhal, ascending to 3000 ft.

Branches glabrous. *Leaves* 5–8 by $1\frac{1}{2}$–3 in., glabrous, young puberulous, much reticulate; nerves oblique, arched. *Sepals* elliptic, 1-nerved, densely hairy. *Petals* $\frac{1}{12}$–$\frac{1}{8}$ in., oblong, subacute, 3–5-nerved. *Filaments* ligulate. *Drupes* $\frac{1}{3}$ in. diam., usually solitary, orbicular, compressed.

9. **S. tomentosa,** *Hook. f.*; branches and nerves of leaves beneath tomentose, leaves elliptic or elliptic-lanceolate acute, petiole very short, panicles branched many-flowered and glabrous, petals linear-oblong, stamens included.

UPPER ASSAM? alt. 3500 ft., *Griffith.*

Branches slender, the younger clothed with soft spreading hairs, as are the petioles. *Leaves* $2\frac{1}{2}$ by 1 in., rather coriaceous, bullate between the spreading nerves, which are very prominent and hairy beneath; petiole $\frac{1}{10}$ in. *Panicle* much branched, many-flowered, peduncle puberulous; branches and pedicels slender, glabrous. *Flowers* $\frac{1}{12}$ in. diam. *Filaments* ligulate, shorter than the petals. *Fruit* didymous, of two obovoid diverging rugose subcompressed carpels, each nearly $\frac{1}{3}$ in. long.—The only specimen I have seen has but two leaves, and is remarkable for its very short petioles and tomentum. There is no habitat on the ticket, which resembles those of Griffith's journey from Upper Assam to Birma. It contains the following inscription:—"Sabia sp., fructibus subrotundis. 15. Alt. 3500."

10. **S. viridissima,** *Kurz in Journ. As. Soc. Beng.* 1872, ii. 304; glabrous, leaves obovate- to elliptic-lanceolate acuminate membranous, petiole $\frac{1}{3}$–$\frac{2}{3}$ in., panicles lax, style 3-fid, stigma curved.

ANDAMAN ISLDS., *Kurz.*

Leaves 6–8 in., acuminate at both ends. *Flowers* small, white, pedicels $\frac{1}{4}$ in., slender, thickened above. *Sepals* glabrous, ovate, obtuse. *Petals* almost $\frac{1}{6}$ in. long. *Stigmas* horse-shoe shaped. *Fruit* unknown.—I know nothing of this species beyond Kurz's description.

2. MELIOSMA, Blume.

(MILLINGTONIA, Roxb., WELLINGTONIA, Meissn.)

Trees or shrubs, usually pubescent or tomentose. *Leaves* simple or odd-pinnate; leaflets subopposite, the terminal rarely wanting. *Flowers* in branched terminal or terminal and axillary panicles, small or minute, hermaphrodite; bracts caducous. *Bracteoles* and *sepals* 5–9, persistent, forming an uninterrupted whorl round the much larger petals, outer smaller. *Petals* 5; 3 large, nearly orbicular, valvate, or imbricate; 2 smaller, interior, placed behind the fertile

stamens, either membranous and nearly free, or reduced to a bifid scale adnate to the filament. *Stamens* 5; 2 fertile, opposite the smaller petals, filament short, flattened, incurved, expanded at the top into a cup, which bears two globose cells that burst transversely, springing back elastically; 3 deformed, broad, opposite the larger petals, 2-fid with 2 empty cells, together forming a cup over the pistil. *Disk* cupular or annular, with 2–5 simple or toothed teeth. *Ovary* sessile, 2- rarely 3-celled, contracted into a simple or 2-partible style, stigma simple; ovules 2 in each cell. *Drupe* small, oblique, subglobose; stone crustaceous, 1-celled, with usually a basilar rounded projection, over which the seed is curved. *Seed* globose, testa membranous; cotyledons conduplicate, radicle incurved.—DISTRIB. Species about 20, natives of Tropical Asia and the Malay Archipelago, with a very few S. America.

* Leaves simple.

† *Leaves serrate-toothed* (*see also* 3. M. Wightii and 4. M. simplicifolia).

1. **M. dilleniæfolia,** *Wall. mss.* (Millingtonia); leaves obovate or oblanceolate coarsely spinulose-toothed pubescent or tomentose beneath, panicles lax slender, flowers pedicelled, sepals and bracteoles ciliate, petals membranous, inner orbicular. *Brandis For. Flor.* 115; *Wt. & Arn. in Ed. New Phil. Journ.*, 1833, 179; *Wt. Ill.* i. 144 (Millingtonia); Millingtonia, *Wall. Cat.* 8116.

TEMPERATE HIMALAYA; from SIMLA, alt. 4–8000 ft., to SIKKIM, alt. 8–10,000 ft. —DISTRIB.? Japan.

A small tree, 20 ft.; branches, petioles, and panicles covered with soft rusty pubescence. *Leaves* 6–12 by 3–5 in., membranous, cuspidate-acuminate, narrowed into the petiole; nerves very many, parallel, ending in marginal teeth. *Panicle* as long as the leaves or longer, spreading, lax-flowered; bracts broad, deciduous; pedicels very short; flowers white. *Drupe* globose, $\frac{1}{8}$ in. diam., sometimes didymous. —This is very near indeed to the Japan *M. myriantha* Sieb. & Zucc., which is just distinguishable by the persistent subulate bracts. Wallich's 8116 seems to be a young state of this, with large leaves glabrous beneath.

2. **M. pungens,** *Wall. Cat.* 8114 *E, F* (Millingtonia); leaves oblanceolate caudate-acuminate coarsely serrate glabrous or puberulous beneath, flowers sessile glomerated, sepals and bracteoles about 7 all suborbicular ciliate, petals membranous. *Brandis For. Flor.* 116, M. acuminata, *Royle Ill.* 139. M. integrifolia, *Wall. Cat.* 8114 *G in part* (Millingtonia). M. rigida and M. ferruginea, *Sieb. & Zucc.* (*in Herb. Hook.*)

SUBTROPICAL and TEMPERATE HIMALAYA; alt. 3–8000 ft., from Marri to Nipal.—DISTRIB. Japan.

A small tree; branches, petioles, and panicles clothed with rusty pubescence. *Leaves* 5–9 in. by 2–3 in., very coriaceous, narrowed into the petiole, almost spinulose serrate, apex long quite entire; nerves stout, ascending, very prominent beneath; petiole $\frac{1}{4}$–1 in. *Panicle* often much larger than the leaves, spreading, erect; flowers densely fascicled on the ultimate branchlets, larger than in *M. dilleniæfolia* or *simplicifolia*. *Drupe* $\frac{1}{3}$ in. diam. globose.—The Japanese specimens have usually longer petioles, but I find no other difference. The densely glomerate larger flowers at once distinguishes this from *M. simplicifolia*. The *M. integrifolia* Wall. Herb. under 8114 G. consists of one specimen of this with nearly entire leaves, and one of *M. simplicifolia*, both from Nipal.

†† *Leaves quite entire, or subserrate when young only.*

3. **M. Wightii,** *Planch. in Herb. Hook;* leaves coriaceous obovate elliptic-obovate or oblanceolate shortly acuminate glabrous or pubescent beneath, flowers sessile glomerate, sepals and bracteoles about 9 broad ciliate the outer pubescent on the back; petals membranous. *Brandis For. Flor.* 116 (*under M. pungens*). Millingtonia simplicifolia, *Wall. Cat.* 8114 *A.* M. pungens,

Wall.; *Wt. & Arn. in Ed. New Phil. Journ.* 1833, 178; *W. & A. Prodr.* 115; *Wight Ic.* t. 964, 3; *Thwaites Enum.* 59; *Bedd. Fl. Sylv. Anal. Gen.* 77; *Bedd. Fl. Sylv. Man.* 77.

WESTERN PENINSULA; from the Concan southwards. CEYLON, Central Province, alt. 5–7000 ft.

Very similar to *M. pungens*, and perhaps only a form of that plant; but the habit is more robust, the leaves usually broader in proportion, less tapered to the base, and quite entire, often more oblong-elliptic, with rarely a caudate apex, and if toothed the teeth are less spinulose; the flowers are of the same size, and similarly aggregated; the fruit also appears to be of the same size.

4. **M. simplicifolia,** *Roxb. Fl. Ind.* i. 103; *Cor. Pl.* t. 254 (Millingtonia); leaves membranous obovate oblanceolate or oblong-lanceolate quite entire or toothed when young glabrous or pubescent beneath, flowers sessile distinct, sepals and bracteoles about 6 ciliate outer narrow hairy on the back. *Wall. Cat.* 8114 *B, C, D*; *W & A. Prodr.* 115 (Millingtonia); M. integrifolia, *Wall. Cat.* 8114 *G* (Millingtonia); *Thwaites Enum.* 59; *Griff. Notul.* iv. 162; *Ic. Pl. As. t.* 442; *Bedd. Fl. Sylv. Anal. Gen.* 77.

TROPICAL HIMALAYA; Nipal, *Wallich;* Sikkim, alt. 2–4000 ft. *J. H. D.*; Bhotan *Griffith*—KHASIA MTS. ascending to 3000 ft.; ASSAM, SYLHET, TENASSERIM at Mergui, *Griffith;* WESTERN PENINSULA, in subalpine forests, *Beddome.* CEYLON, common up to an elevation of 3000 ft. DISTRIB. Java?

A large tree; branchlets and petioles puberulous, panicles pubescent. *Leaves* 6–16 by 4–7 in., narrowed into the petiole, young sometimes obtusely toothed, usually membranous, shortly acuminate, glabrous or puberulous beneath, with strong raised nerves; petiole ½–2 in. *Panicle* often longer than the leaves, sometimes leafy, or panicles in the upper axil; branches slender. *Flowers* much smaller than in *M. Wightii*, not glomerated, more hairy on the bracts and sepals, which are much more acute. *Fruit* about ⅙ in. diam.—Miquel gives this as a native of Java, but I have seen no specimen from Java exactly according with it. I have seen no Western Peninsula specimens of this, but Beddome says it is common on the Ghats, about 2–3000 ft. elevation, above which its place is taken by *M. pungens* (*Wightii*).

5. **M. elliptica,** Hook. f.; leaves coriaceous elliptic acuminate at both ends quite entire densely rufous pubescent or tomentose beneath, panicle densely tomentose, flowers sessile distinct, sepals and bracteoles 3–6, orbicular very coriaceous subciliate, petals very coriaceous subvalvate. Sabia? floribunda, *Miq. Fl. Ind. Bat. Suppl.* i. 521.

MALACCA, *Griffith, Maingay;* SINGAPORE, *Lobb.*

A tree?; branchlets, petioles, leaves beneath and panicles clothed with very soft rusty dense almost velvety tomentum. *Leaves* 3–7 by 1½–3 in., glabrous except the pubescent midrib above, quite entire, rarely oblanceolate, narrowed into the petiole; nerves arched, very prominent beneath; petiole ⅓–½ in. *Panicle* as in the genus, usually larger than the leaves. *Flowers* of the size of *M. simplicifolia*, very distinct from all the preceding in the small coriaceous glabrous sepals. *Staminal scales* 2-fid, ciliate at the tip (Maingay)—Kurz (Jour. As. Soc. Beng. 1870, ii. 74) refers *Sabia? floribunda* of Miquel to *M. simplicifolia*, meaning no doubt this species, under which I hence cite it.

6. **M. lancifolia,** Hook. f.; clothed with spreading villous pubescence, leaves very long oblanceolate acuminate membranous, flowers sessile, aggregated, sepals and bracteoles 5 outer lanceolate ciliate and hairy on the back inner glabrous oblong.

MALACCA, *Maingay.*

Branchlets cylindric, clothed with a rough and much more spreading pubescence than in any of the other species, especially on the panicle and nerves of the leaves be-

neath. *Leaves* 12-18 by 3½-4 in., very long and narrow, very acuminate, but not caudate, very gradually narrowed into the short petiole; upper surface minutely scabrid; nerves numerous, arching. *Panicle* shorter than the leaves (in the only specimen). *Flowers* as small as in *M. simplicifolia*, crowded on the ultimate branchlets. *Inner sepals* very coriaceous, obtuse, quite glabrous. *Petals* and *fruit* not seen.

** Leaves odd-pinnate.

† *Leaflets serrate or toothed.*

7. **M. pinnata,** *Roxb. Fl. Ind.* i. 104 (Millingtonia); nearly glabrous, leaflets 6-12 pairs oblong or oblong- or linear-lanceolate acuminate more or less serrate glabrous, panicle puberulous very large, flowers pedicelled or sessile. *Maxim. Diagn. Fl. Jap. Dec.* iv. and v. 263; *Wall. Cat.* 8115 & 8117.

SIKKIM HIMALAYA, alt. 1000 ft. *J. D. H.* SILHET, *Roxburgh.* KHASIA MTS., alt. 3-5000 ft. *H. f. & T.* UPPER ASSAM, *Griffith.*—DISTRIB. Japan?

A middling-sized tree; branches smooth. *Leaves* 6-18 in.; petiole cylindric; leaflets 3-6 by 1-1½ in. shortly petiolulate, much acuminate, sometimes nearly entire. *Panicle* as long as the leaves, terminal; branches spreading; bracts minute, caducous, subulate. *Flowers* white, minute. *Sepals* and *bracteoles* 5, broadly orbicular-ovate, minutely ciliate, otherwise glabrous. *Petals* subvalvate, glabrous. *Disk* 3-angled. *Drupe* as large as a pea.—The *M. rhoifolia*, Maxim., of Japan seems to be the same as this.

8. **M. Wallichii,** *Planch. in Herb. Hook.;* pubescent, leaflets 3-6-pairs oblong oblong-ovate or obovate-acuminate more or less spinulose-toothed, pubescent beneath, panicle tomentose, flowers very shortly pedicelled.

TROPICAL HIMALAYA; Nipal, *Wallich;* Sikkim, *Herb. Griffith.* KHASIA MTS., alt. 4-6000 ft., *H. f. & T.*—DISTRIB. Korea.

A small tree; branchlets rusty puberulous. *Leaves*, 6-12 in.; leaflets, 3-7 in., straight or falcate, rather coriaceous; petiole, petiolules and under-surface clothed with a spreading rusty tomentum; nerves many, curved; upper surface opaque; base rounded oblique. *Panicle* stout, much branched; hairs short spreading; bracts caducous. *Flowers* minute, on short stout pedicels. *Sepals* and *bracteoles* 5, glabrous, orbicular-ovate. *Petals* subvalvate. *Drupe* globose, the size of a small pea.—Small specimens of this from Moflong in the Khasia seem identical with a Corëan plant collected by Wilford.

†† *Leaflets quite entire.*

9. **M. Arnottiana,** *Wight, Ill.*, i. 144, t. 53 (Millingtonia); rusty-tomentose, leaflets 5-7 pairs subopposite ovate-lanceolate subcaudate acuminate pubescent beneath, panicles rusty pubescent, flowers crowded sessile or shortly pedicelled. *Thwaites Enum.* 59; *Bedd. Fl. Sylv. t.* 160. Sapindus? microcarpus, *W. & A. Prodr.* 112.

WESTERN PENINSULA; from Canara southwards, *Wight.* CEYLON; in the central province, alt. 4-7000 ft.

A tree?; branchlets, petioles, petiolules, leaflets beneath and panicle clothed with a spreading subfurfuraceous or velvety rusty pubescence. *Leaves* 6-10 in.; leaflets 3-5 by 1¼-1½ in., rather membranous, lower often falcate and recurved, base rounded, nerves not prominent, tips finely drawn out, upper surface opaque; petiolules ¼-⅓ in. *Panicle* axillary and terminal. *Flowers* very numerous, crowded on the branchlets of the panicle. *Sepals* and *bracteoles* 5, orbicular-ovate, obtuse, ciliolate, rather pubescent. *Petals* subvalvate. *Drupe* globose, the size of pea.

10. **M. sumatrana,** *Jack in Mal. Misc.* ii. 30 (Millingtonia); glabrous, leaflets 3-6 pairs elliptic- or obovate- or ovate-lanceolate acuminate base acute panicle contracted pubescent, flowers large crowded. M. nitida, *Blume Cat.*

Hort. Buit. 32; *Rumphia,* iii. 202, tab. 169; *Nees in Flora,* 1825, 106 (Millingtonia); *Miq. Fl. Ind. Bat.* i. pt. 2, 617. Irina integerrima, *Blume Bijd.* 231.

MALACCA, *Griffith, Maingay.*—DISTRIB. Sumatra.

A moderate-sized tree; branchlets glabrous. *Leaves* 1–1½ ft.; petiole nearly terete; leaflets 6–10 in., opposite, very variable in shape, coriaceous, shining on both surfaces; nerves arched, much reticulate; petiolules ½–⅔ in. *Panicle* stout, erect, rusty-pubescent, with rather spreading short pubescence; bracts acuminate, ciliate. *Sepals* and *bracteoles* 5, the outermost very small, broadly orbicular-ovate, rather thick, glabrous. *Petals* subvalvate. *Filaments* larger than usual in the genus, without lateral teeth, the scale (petal) behind them being larger, elliptic and entire. *Fruit* nearly ¾ in. diam.—I think there can be no doubt but that this is Jack's *M. Sumatrana;* and that it is the same with Blume's *M. nitida.* I have in proof Java specimens of the latter named by Blume. Jack states that the terminal leaflet is sometimes absent. Griffith has a single imperfect specimen of apparently this plant from Malacca, with a few spinulose teeth on the upper part of the leaflets; it may be *M. confusa,* Bl. of Sumatra.

11. **M. lanceolata,** *Blume Cat. Hort. Buit.* 32; *Rumphia,* iii. 200, t. 168 (B. excepted), var. *pubescens;* pubescent, leaflets 6–8 pairs, very coriaceous linear-oblong caudate-acuminate pubescent beneath margins recurved, panicle tomentose with very long branches.

MALACCA, Mt. Ophir, *Griffith, Maingay* (M. Sumatrana, *Kew distrib. not of Jack*).—DISTRIB. Sumatra, Borneo.

A tree; branchlets stout, rusty-pubescent. *Leaves* 1–2 ft.; petiole stout, terete; leaflets 5–7 by 1½–1¾ in., often recurved and subfalcate, base rounded, rigidly coriaceous, shining above, opaque and pubescent beneath with much raised nerves; petiolules stout, ⅓ in. *Panicles* very large, with long spreading branches, almost velvety with rusty tomentum. *Flowers* minute, rather scattered, sessile or nearly so. *Sepals* and *bracteoles* 4 or 5, broadly orbicular-ovate, glabrous, outer ciliate. *Petals* valvate. *Filaments* short; scales 2-fid. *Fruit* not seen.—The Bornean and Sumatra specimens are more glabrous on the leaflets beneath, but I find no other difference.

NAT. ORD. XLVI. ANACARDIACEÆ. (By J. D. Hooker.)

Trees or shrubs; juice often milky and acrid. *Leaves* alternate, opposite in *Bouea,* exstipulate, simple or compound. *Inflorescence* various; flowers small, regular, unisexual, polygamous, or bisexual. *Calyx* 3–5-partite, sometimes accrescent, spathaceous in *Gluta.* *Petals* 3–5, alternate with the sepals, free, rarely 0, imbricate or valvate in bud, sometimes accrescent. *Disk* flat, cup-shaped or annular, entire or lobed, rarely obsolete. *Stamens* as many as the petals, rarely more, inserted under, rarely on, the disk, filaments usually subulate; anthers 2-celled, basi- or dorsi-fixed. *Ovary* superior, half inferior in *Holigarna,* 1- or 2-6-celled, rudimentary or 2–3-fid in the ♂; of 5–6 free carpels in *Buchanania;* styles 1–4, or stigma subsessile; ovules solitary in the cells, pendulous from the top or wall or from an ascending basal funicle. *Fruit* usually a 1–5-celled 1–5-seeded drupe; stone sometimes dehiscent. *Seed* exalbuminous; embryo straight or curved, cotyledons plano-convex, radicle short.—DISTRIB. Chiefly tropical; genera about 45; species about 450.

Sorindeia Madagascariensis, DC. (*Wall. Cat.* 8491), is cultivated in gardens in India.

TRIBE I. **Anacardieæ.** *Ovary* 1-celled, or if 2-celled, with one cell early suppressed.

A. Ovules pendulous from a basal funicle.

* *Sepals and petals not accrescent.*

Calyx 4–5-partite. Petals 4–6. Stamens 4–10. Leaves alternate, usually compound	1. Rhus.
Calyx 5-partite. Petals 0. Stamens 3–4. Leaves alternate, compound	2. Pistacia.
Calyx 4–5-partite. Petals 4–5. Stamens 1–5. Style filiform. Leaves alternate, simple	3. Mangifera.
Calyx 5-partite. Petals 5. Stamens 8–10, all or a few only perfect. Torus stipitate. Style filiform. Leaves alternate,simple	*3. Anacardium.
Calyx 3–5-partite, valvate. Petals 3–5. Stamens 3–5, all perfect. Style short. Leaves opposite, simple . .	4. Bouea.
Calyx spathaceous. Petals 4–6. Stamens 4–6. Torus stipitate. Style filiform. Leaves alternate, simple . .	5. Gluta.
Calyx 3–5-lobed. Petals 3–5. Stamens 10. Carpels 5–6, one only perfect. Styles short. Leaves alternate, simple	6. Buchanania.

** *Sepals or petals accrescent. Leaves simple.*

Calyx spathaceous. Stamens 5 or numerous . . .	7. Melanorrhœa.
Calyx 5-partite. Stamens 5	8. Swintonia.

B. Ovules pendulous from the top of the cell or from the walls of the ovary above the middle.

* *Leaves 3-foliolate or pinnate.*

Calyx not accrescent. Petals valvate. Stamens 10. Style 1	9. Solenocarpus.
Calyx not accrescent. Petals imbricate. Stamens 10. Style 1	10. Tapiria.
Calyx not accrescent. Petals imbricate. Stamens 5, with 5 staminodes. Style very short	11. Pentaspadon.
Calyx not accrescent. Petals imbricate. Stamens 8–10. Styles 3–4	12. Odina.
Calyx accrescent. Petals 4. Stamens 4. Style 3-fid .	13. Parishia.

** *Leaves simple.*

Petals imbricate. Stamens 5. Styles 3. Drupe on a much enlarged peduncle	14. Semecarpus.
Petals imbricate. Stamens 5. Style 1. Drupe superior .	15. Drimycarpus.
Petals valvate. Stamens 5. Styles 3. Drupe inferior . .	16. Holigarna.
Petals valvate. Stamens 5. Style 1. Drupe superior .	17. Melanochyla.
Petals imbricate. Stamens 4. Style 1, short. Drupe superior	18. Nothopegia.
Petals imbricate. Stamens 6–10. Style 1. Drupe superior	19. Campnosperma.

Tribe II. **Spondieæ.** *Ovary* 2–5-celled; ovules pendulous. *Leaves* pinnate.

Flowers polygamous. Stamens 8–10. Styles 4–5, free above	20. Spondias.
Flowers bisexal. Stamens 10. Styles 5, thick, connate at the lips	21. Dracontomelum.

DOUBTFUL GENUS.

Calyx 3-fid. Stamens 3. Ovary 3-celled. Leaves entire .	? 22. Rumphia.

1. **RHUS,** Linn.

Trees or shrubs, with often an acrid juice. *Leaves* alternate, simple or 1-3-foliolate or pinnate; leaflets quite entire or serrate. *Flowers* small, in terminal and axillary panicles, polygamous. *Calyx* small, 4–6-parted, persistent; segments nearly equal, imbricate. *Petals* 4–6, equal, spreading, imbricate. *Stamens* 4, 5, 6, or 10, inserted at the base of the disk, free; filaments subulate; anthers short, imperfect in the ♀ flower. *Ovary* sessile, ovoid or globose, 1-celled; styles 3, free or curvate, short or long; stigmas simple or capitate; ovule pendulous from a basal funicle. *Drupe* small, dry, compressed; stone coriaceous, crustaceous or bony. *Seed* pendulous from the funicle, testa membranous, cotyledons flattish, radicle hooked short superior.—A large genus of about 120 species, natives chiefly of warm temperate regions.

Sect. 1. **Cotinus.** *Leaves* simple. *Panicle* with many flowerless finally elongate capillary hairy pedicels. *Flowers* bisexual. *Drupe* obovate, compressed, stone triangular.

1. **R. Cotinus,** Linn.; *Boiss. Fl. Orient.* ii. 4; leaves long-petioled elliptic or obovate glabrous or tomentose. *Brandis For. Flor.* 118. R. velutina, *Wall. Cat.* 998 (*excl. C. in Herb. Linn. Soc.*); R. lævis, *Wall. mss. in G. Don Gen. Syst.* ii. 65.

Western Subtropical Himalaya; alt. 3–5000 ft., from Marri to Kumaon.—Distrib. from Syria westwards to France.

A shrub or small tree. *Leaves* 2–4 in., obtuse; nerves spreading, parallel; petiole very slender, 1–2 in. *Panicles* axillary and terminal, very large, slender, and many-flowered. *Flowers* $\frac{1}{8}$ in. diam.; pedicels very slender. *Sepals* linear-oblong, obtuse. *Petals* twice as long, elliptic. *Stamens* shorter than the petals; anthers large. *Disk* broad, 4-angled. *Drupe* $\frac{1}{6}$ in., compressed, covered with white hairs.—The numerous hairy flowerless pedicels of the very large copious panicles give this bush a remarkable appearance during and after flowering. *Wall. Cat.* 998 C. (in Herb. Linn. Soc. only) is *Rhus succedanea.*

Sect. 2. **Sumac.** *Leaves* 3-foliolate or odd-pinnate. *Flowers* polygamous diœcious or bisexual. *Drupe* ovoid or orbicular.

* Leaves trifoliolate.

2. **R. parviflora,** *Roxb. Fl. Ind.* ii. 100; softly tomentose, leaflets elliptic oblong-obovate or orbicular irregularly crenate above the middle. *DC. Prodr.* ii. 70; *Wall. Cat.* 991; *Dalz. & Gibs. Bomb. Flor. Suppl.* 19; *Brandis For. Flor.* 119.

Western Himalaya; alt. 2-5000 ft., from Kumaon to Nipal. Central India on the Pashmarchi hills, *Brandis.*

An unarmed shrub; branchlets, leaves beneath, petioles and panicle densely clothed with soft rusty tomentum. *Leaves* palmate, 3-foliolate; petiole 1–1½ in., stout; leaflets 1½–3 in., sessile or the terminal contracted into a petiole, coriaceous, tomentose on both surfaces especially beneath; nerves spreading, parallel. *Panicles* axillary and terminal, silky, longer than the leaves. *Flowers* $\frac{1}{10}$ in. diam.; pedicels very short; bracts linear. *Sepals* ovate, the outer hairy. *Petals* twice as long, oblong. *Disk* 5-lobed. *Drupe* $\frac{1}{6}$ in. diam., ovoid, compressed, red-brown, shining.—The Ceylon specimens alluded to in Brandis are no doubt cultivated ones.

3. **R. mysorensis,** *Heyne; W. & A. Prodr.* 172; pubescent, leaflets small obovate or cuneate sinuate-toothed or -lobed. *Brandis For. Flor.* 119; *Beddome Fl. Sylv. Anal. Gen.* 78. t. xi. f. 3; *Wall. Cat.* 997.

North Western India; Scind, *Stocks;* Rohilkund, near Delhi. Western Panjab, Sulima range, alt. 2500–5000 ft. Western Peninsula; Maisor and the Dekkan.

A small shrub; branches woody, flexuous, often spinous; branchlets, petioles,

leaves beneath, and panicle clothed with a rather furfuraceous pubescence. *Leaves* palmately 3-foliolate; petiole $\frac{1}{2}$–$\frac{2}{3}$ in.; leaflets $\frac{1}{2}$–$1\frac{1}{2}$ in., the terminal always much the largest, lateral often very small, all sessile and contracted at the base. *Panicles* subsimple, very slender, axillary and terminal. *Flowers* $\frac{1}{12}$ in. diam.; pedicels short; bracts minute. *Sepals* ovate, 2 smaller. *Petals* oblong, much larger than the sepals. *Stamens* short. *Disk* obscurely 5-lobed. *Drupe* $\frac{1}{8}$ in. diam., subglobose, compressed, red-brown, shining.—Brandis suspects that this may be a form of *R. parviflora*, but I cannot think so.

4. **R. paniculata,** *Wall. Cat.* 993; glabrous, leaflets elliptic or elliptic-oblong obtuse entire or very obscurely sinuate-lobed.

BHOTAN, *Griffith;* BIRMA at Yenangheum, *Wallich.*—DISTRIB. Yunan.

Probably a tree; quite glabrous except the minutely puberulous panicles. *Leaves* rather coriaceous, palmately 3-foliolate; petiole 1–$1\frac{1}{2}$ in.; leaflets 3–5 by 1–2 in., rarely oblanceolate, sessile, contracted at the base, terminal the largest and sometimes petiolulate; nerves many, spreading, parallel. *Panicles* very slender, axillary and terminal, elongate; branchlets recurved. *Flowers* $\frac{1}{16}$ in.; shortly pedicelled. *Sepals* orbicular. *Petals* not much larger, ovate-oblong, obtuse. *Disk* cup-shaped. *Drupe* $\frac{1}{6}$ in. diam., nearly orbicular, depressed.

** Leaves odd-pinnate.

† *Leaflets pubescent or tomentose beneath.*

5. **R. semi-alata,** *Murray; DC. Prodr.* ii. 67; petiole usually winged above, leaflets 4–6-pairs sessile toothed densely pubescent beneath, panicle equalling the leaves, pericarp indehiscent. *Brandis For. Flor.* 119. R. bucki-amela, *Roxb. Fl. Ind.* ii. 99; *Wight Ic.* t. 561; *Wall. Cat.* 994. R. javanica, *L.* (fid. *DC.*). R. Amela, *Don Prodr.* 248.

TEMPERATE HIMALAYA; from Banahal to Sikkim, alt. 3–6000 ft. KHASIA MTS., alt. 3–5000 ft.

A small tree; branchlets, petioles, leaves beneath and panicles clothed with a dense soft pubescence. *Leaves* 10–18 in.; petiole cylindric; leaflets coriaceous, sessile, oblong, acuminate, base cuneate, terminal petiolulate, opaque above, pale reddish-white beneath; nerves many, parallel. *Panicle* large, broad, with a stout peduncle. *Flowers* $\frac{1}{12}$ in., white or pale yellow-green. *Sepals* ovate, obtuse, pubescent. *Petals* much larger, oblong, ciliate, and with a ciliate median ridge on the upper surface. *Stamens* exceeding the petals; anthers large. *Disk* cup-shaped, 10-lobed. *Styles* rather long. *Drupe* $\frac{1}{5}$ in. diam., orbicular, compressed, red, shining, acid.—I have specimens from the Bombay Presidency collected by Dr. Gibson (perhaps cultivated), and from Ritchie (Griffith's Herbarium) collected at Baraghur (probably east of the Indus) with the name "Semall-Shoorookee." The leaves are very small, the leaflets about 1 in. long, more sharply serrated; it may be a different species.

6. **R. punjabensis,** *Stewart in Brandis For. Flor.* 120; petiole not winged pubescent, leaflets 5–6-pairs sessile quite entire or serrate towards the tip slightly pubescent beneath, panicles much smaller than the leaves, flowers sessile, pericarp indehiscent.

NORTH WESTERN HIMALAYA; Kunawur, alt. 6000 ft., *Thomson.* Rajaori and Bussahir, alt. 2500–8000 ft., *Brandis.*

A tree 30–40 ft.; branchlets, petioles, leaves beneath and panicles covered with a very fine pale pubescence. *Leaves* 12–18 in.; petiole slender, terete; leaflets sessile, oblong or ovate-oblong, acuminate, membranous, opaque above, base rounded; nerves numerous, slightly arched, simple. *Panicles* about half the length of the leaves, subsessile; branches dense, spreading. *Flowers* unknown. *Drupes* $\frac{1}{6}$ in. diam., orbicular, compressed, red, tomentose.

7. **R. khasiana,** *Hook. f.;* petiole very slender glabrous, leaflets 8–12-

pairs membranous subsessile lanceolate incised-serrate long-acuminate hairy chiefly on the nerves beneath, pericarp dehiscent.

KHASIA MTS.; at the Borpanee, and at CHITTAGONG. *H. f. & T.*

A large tree. *Leaves* 1–1½ ft.; petiole terete, soft, pubescent towards the tip; leaflets 3–4 by ⅔–¾ in.; base cuneate, oblique, glaucous beneath; nerves very slender, about 15 pairs, arched, clothed with soft white spreading hairs. *Flowers* not seen. *Drupes* ⅓ in. diam., in open panicles, pedicelled, orbicular-ovate, compressed; epicarp papery, pale, irregularly torn, exposing a fibrous endocarp.—I have only examined imperfect specimens of this very distinct plant, which approaches *R. punjabensis* in habit.

8. **R. Wallichii,** *Hook. f.;* petiole tomentose not winged, leaflets 3–5-pairs subsessile quite entire densely softly tomentose beneath, panicles much shorter than the leaves, pericarp dehiscent. R. vernicifera (in part), *DC. Prodr.* ii. 68; *Royle Ill.* 175; *Brandis For. Flor.* 120. R. juglandifolia, *Wall. Cat.* 996 (not of Willdenow).

TEMPERATE HIMALAYA; from Garwhal to Nipal, alt. 6–7000 ft.

A tree; branchlets stout, petioles and leaves beneath and panicles, clothed with a soft dense rusty tomentum. *Leaves* 12–18 in.; petiole terete; leaflets 6–9 by 2–3 in., coriaceous, elliptic or oblong, acuminate, shortly petiolulate; base rounded, upper surface pubescent or glabrous; nerves 20–25 pairs, parallel. *Panicles* much shorter than the leaves, axillary; branches short, stout. *Flowers* subsessile, $\frac{1}{10}$ in. diam. *Sepals* small, broadly ovate, obtuse. *Petals* much larger, obovate, concave, white ? with very broad dark veins. *Filaments* short; anthers large. *Disk* broad, cup-shaped, obscurely lobed. *Drupes* densely crowded, ⅓ in. diam., globose, puberulous; epicarp dry, crustaceous, bursting irregularly; stone globose, very thick, bony, surrounded by wax.—I agree with Brandis in regarding this as quite distinct from the Japanese wax tree (*R. vernicifera*), from which it differs in the sessile flowers and laxer and longer panicles; juice corrosive. The Sikkim specimens referred to this species by Brandis have glabrous petioles, and belong to *R. insignis.*

9. **R. insignis,** *Hook f.*; petiole not winged glabrous, leaflets 3–4 pairs, petiolulate glabrous above tomentose beneath, panicles shorter than the leaves, drupe pedicelled, pericarp dehiscent.

SIKKIM HIMALAYA, interior valleys, alt. 3–6000 ft. *J. D. H.* KHASIA MTS. at Nurtiung, alt. 4000 ft. *H. f. & T.*

A small beautiful tree. *Leaves* 12–18 in.; petiole terete; leaflets 6–9 by 3–4½ in., coriaceous, quite entire, elliptic or oblong, abruptly acuminate, glabrous and shining above, rusty, softly tomentose beneath; nerves very numerous, as in *R. Wallichii. Flowers* not seen. *Fruiting panicles* axillary, stout, 10 in. long-peduncled; branches spreading. *Drupes* scattered on the panicle, globose ⅓ in. diam.; epicarp thin, dry, bursting irregularly and enclosing a globose white mass of wax containing a very small flattened crustaceous stone.—Similar in many respects to *R. Wallichii*, but very different in the glabrous petiole and panicle, petioluled leaflets that are often cordate at the base, large lax glabrous panicles, and smaller very different fruit. The panicles and petioles are crusted with lenticels in some Sikkim specimens.

10. **R. ? Dhuna,** *Hamilton in Wall. Cat.* 8502 (Terebinthaceæ ?); petiole not winged and leaflets beneath softly tomentose; leaflets 4 pairs petiolulate oblong abruptly acuminate.

NIPAL at Patgong, *Hamilton.*

Leaves 2 ft.; petiole stout, cylindric, grooved; leaflets 6–10 by 3–4 in., coriaceous, terminal obovate, with a cuneate base, the rest oblong with a cordate base; midrib stout; nerves 25 pairs slightly arched; under surface clothed with soft spreading hairs, upper smooth, glabrous, with a slender midrib; petiolule robust, cylindric ⅓–½ in.—I have only leaves of this very fine plant, which appear to be closely allied to *R. Wallichii*, and *R. insignis*, differing from the former in the much less tomentose leaves and petiolulate leaflets, and from the latter in the pubescent petiole.

†† *Leaflets quite glabrous beneath.*

11. **R. succedanea,** Linn.; glabrous, leaflets 3–6 pairs oblong- elliptic- or ovate-lanceolate caudate acuminate, panicle slender, flowers pedicelled, pericarp dehiscent. *DC. Prodr.* ii. 68; *Roxb. Fl. Ind.* ii. 98; *Wight. Ic.* t. 560; *Brandis For. Flor.* 121; *Wall. Cat.* 992. R. acuminata, *DC. Prodr.* ii. 68. Spondias? *Wall. Cat.* 8479.

Temperate Himalaya, from Kashmir, alt. 3–6000 ft.; to Sikkim, alt. 5–8000 ft. and Bhotan; Khasia Mts., alt. 2–6000 ft.—Distrib. Japan.

A tree about 30 feet high, everywhere glabrous, except the panicle in some varieties. *Leaves* crowded at the ends of the branches, 6–18 in.; petiole terete, slender; leaflets 2–5 by 1½–2½ in., petiolulate, elliptic-oblong or oblong- or ovate-lanceolate, tip very slender; base rounded or acute, straight or oblique; nerves numerous, slightly arched, slender. *Panicles* axillary, half the length of the leaves, slender, lax, with a very few scattered hairs, or glabrous. *Flowers* $\frac{1}{12}$th in. diam., yellow-green; pedicel slender. *Sepals* broadly ovate, obtuse. *Petals* much larger, oblong or obtuse. *Disk* 5-lobed. *Drupes* ¼ in. diam., in drooping panicles, gibbous, compressed, epicarp very thin, bursting irregularly; stone compressed, bony, surrounded with wax.—Perhaps two or three species are mixed up here, but I cannot satisfactorily distinguish them without more complete specimens than I possess.

Var. 1. *himalaica;* shoots glabrous, leaves scattered, petiole 1–2 ft., leaflets 6–8 pairs, 4–6 by 1½–2¼ in. petiolulate obliquely ovate-lanceolate acuminate very membranous, midrib often pilose beneath, nerves 10–15 pairs, much arched, panicle pubescent in flower, fruiting glabrous very lax, drupes pedicelled laterally compressed.—N.W. Himalaya, alt. 3–6000 ft., from Kashmir to Nipal. This differs from the Japanese plant in the pubescent panicle and fewer more-arched nerves. There are fruits of it from Nipal in Wallich's Herbarium on the sheet with var. 3.

Var. 2. *sikkimensis;* shoots pubescent, leaves as in var. 1, flowering panicle lax glabrous, fruit unknown.—A large tree of the Sikkim inner valleys, Lachen-Lachoong, etc., alt. 5–8000 ft.

Var. 3. *acuminata, DC. Prodr.* ii. 68 (*sp.*); leaves usually crowded at the ends of the branches, petiole 6–10 in., leaflets 2–5 pairs, 2–5 by 1½–2 in. elliptic or elliptic-obovate or -oblong often abruptly caudate-acuminate at length coriaceous, nerves 25–30 pairs horizontal straight parallel, panicle glabrous in flower, fruiting panicle more dense, drupes on very short stout pedicels laterally compressed.—Himalaya from Nipal to Bhotan, Khasia Mts.

Var. 4. *sphærocarpa*; leaves of var. 3, drupes depressed spheres.—Khasia, *Griffith.*

12. **R. Griffithii,** *Hook f.;* glabrous, leaflets 4–7 pairs oblong or ovate-oblong acuminate, panicle stout pubescent, flowers subsessile, pericarp dehiscent.

Khasia Mts. alt. 4–6000 ft., *Simons*, etc.; Mishmi Hills, *Griffith.*

A small tree. *Leaves* towards the ends of the branches, 1–2 ft.; petiole stout, terete; leaflets 5–10 by 2½–4½ in., coriaceous, quite entire, rounded or cordate, rarely acute at the base, glabrous and opaque above, very obscurely puberulous on the midrib and principal nerves beneath; petiolules ¼ in., very stout; nerves strong. *Panicles* 5–6 in. long, axillary; peduncle and branches stout, pubescent. *Flowers* $\frac{1}{10}$ in. diam., almost sessile. *Sepals* broadly ovate, obtuse, pubescent. *Petals* much larger, linear-oblong, obtuse. *Stamens* exserted. *Disk* broad, sinuate-lobed. *Drupes* on short stout pedicels, about ¼–⅓ in. diam., nearly orbicular, compressed; epicarp thin, bursting irregularly; stone compressed, surrounded with wax.—A very distinct species, closely allied to *R. succedanea*, from which it differs in its much larger size, stouter habit, larger leaflets often cordate at the base, pubescent stout panicle, nearly sessile flower and smaller drupes.

2. **PISTACIA,** Linn.

Trees or shrubs. *Leaves* alternate, exstipulate, pinnate, or 3-foliate. *Flowers* small, apetalous in axillary racemes or panicles, diœcious. MALE FL. *Calyx* 3-5-fid. *Stamens* 3–7. *Disk* small. *Rudiment of Ovary* minute or 0. FEM. FL. bracteate. *Sepals* 3–4. *Stamens* and *Disk* 0. *Ovary* sessile, 1-celled; style short, 3-fid, stigmas capitate, recurved; ovule pendulous from a basal funicle. *Drupe* dry; stone bony. *Seed* with a membranous testa; cotyledons thick, oily, curved. DISTRIB. Species about 6, natives of Western Asia and the Mediterranean region, and one Mexican.

Several species of this genus, allied to Mediterranean forms, are found in Affghanistan and Beluchistan, but do not cross the frontier. The seeds of *P. vera,* L. the Pistachio-nut, are imported into N. Western India.

P. integerrima, *Stewart in Brandis For. Flor.* 122, t. xxii.; leaflets 4-5 pairs lanceolate caudate-acuminate. Rhus integerrima, *Wall. Cat.* 8474. R. Kakrasingee, *Royle Ill.* 175.

NORTH-WESTERN FRONTIER; Peshwur valley and Salt range. WESTERN HIMALAYA; alt. 1200 to 8000 ft., from the Indus to Kumaon, usually on hot slopes.

A nearly glabrous tree, 40 ft. and upwards. *Leaves* 6–9 in., with or without a terminal leaflet; petiole terete, puberulous; leaflets sub-opposite, petiolulate, coriaceous, quite entire, base oblique; nerves many, arched. *Panicles* lateral; ♂ compact, pubescent; ♀ lax, elongate; flowers pedicelled, with 2 ovate bracts. *Stamens* 5–7, filaments short; anthers large, dark red. FEM. FL. *Sepals* 4, linear, and bracts deciduous. *Style* almost 3-partite. *Drupe* ¼ in., broader than long, glabrous, rugose, grey.—Wood very hard and handsome.

3. **MANGIFERA,** Linn.

Trees. *Leaves* alternate, petioled, quite entire, coriaceous. *Flowers* small, polygamous in terminal panicles, pedicel articulate; bracts deciduous. *Calyx* 4-5 partite; segments imbricate, deciduous. *Petals* 4-5, free or adnate to the disk, imbricate; nerves thickened, sometimes ending in excrescences. *Stamens* 1–5, rarely 8, inserted just within the disk, or on it, 1 rarely more perfect and much larger than the others, the others with imperfect or smaller anthers, or reduced to teeth. *Ovary* sessile, 1-celled, oblique; style lateral; ovule pendulous, funicle basal, inserted on the side of the cell above its base, rarely horizontal. *Drupe* large, fleshy; stone compressed, fibrous. *Seed* large, compressed, testa papery; cotyledons plano-convex, often unequal and lobed. DISTRIB. A tropical Asiatic, chiefly Malayan genus, of about 30 species.

Of the species here described some may be referable to Malayan ones that are imperfectly described by Blume and others. The genus is a very difficult one, and the Malayan species want careful revision with many specimens.

SECT. 1. *Disk* tumid, usually 5-lobed, broader than the ovary. *Petals* free from the disk, inserted at its base.

* *Petals* with 1–5 free or confluent ridges that do not end in wart-like excrescences.

† *Panicle pubescent or tomentose.*

1. **M. indica,** Linn.; leaves oblong or linear-oblong or elliptic or obovate-lanceolate obtuse acute or acuminate, panicle usually tomentose, petals 5 with 3 ridges, stamens 1 fertile and 4 reduced to short capitate subulate filaments, style sub-terminal. *Roxb. Fl. Ind.* i. 641; *W. & A. Prodr.* 170;

Beddome Fl. Sylv. t. 162; *Wall. Cat.* 8487 (*excl. D. G. & I.*); *Dalz. & Gibs. Bomb. Flor.* 51; *Bot. Mag. t.* 4510; *Brandis For. Flor.* 125. M. domestica, *Gaertn. Fruct. t.* 100.—*Rheede Hort. Mal.* iv. t. 1, 2.

TROPICAL HIMALAYA; alt. 1–3000 ft. from Kumaon to Bhotan Hills and valleys of BEHAR, the KHASIA MTS., BIRMA, OUDH, and WESTERN PENINSULA from Kandeish southwards.—DISTRIB. Cultivated as far west as Muscat, in all Eastern tropical Asia, and generally in the tropics.

A large tree, glabrous, except the panicle; branches widely spreading. *Leaves* 6–16 in., very variable in breadth, crowded at the ends of the branches, acute, acuminate or obtuse, shining, nerved, quite entire, margins often undulate; petiole 1–4 in., swollen at the base. *Panicles* a foot and more, pubescent, rarely glabrate; bracts elliptic, concave. *Flowers* yellow, odorous, subsessile, rarely pedicelled, ♂ and ☿ on the same panicle. *Sepals* ovate, oblong, concave. *Petals* twice as long, ovate, ridges 3–5, orange. *Disk* fleshy, 5-lobed. *Stamen* 1, inserted upon the disk, filament subulate; anther purple. *Ovary* glabrous. *Drupe* 2–6 in., compressed, yellow.—It is often difficult to say whether so common a tree is wild or not in a given locality, but there seems to be little doubt but that it is indigenous in the localities enumerated above. Amongst the varieties, those with an almost glabrous panicle from the Western Peninsula look the most unlike the ordinary cultivated form. One Maisor specimen has leaves 10 by 1⅓ in., much resembling those of *M. oblongifolia*, Wallich's 8487 D. is a *Sorindeia*, a Madagascar plant accidentally intermixed; 8487 G. is *Buchanania? acuminata* (*Wall. Cat.* 981), and 8487 I. is, I suspect, *M. sylvatica.*

2. **M. caloneura,** *Kurz in Beng. As. Soc. Journ.* 1873, ii. 66; leaves oblong or oblong-lanceolate finely reticulated between the nerves acuminate, panicle spreading tomentose, flowers crowded sessile, petals 5 with 3 ridges, stamens 1 or 2 fertile, ovary rough, style lateral or basal.

MARTABAN, *Kurz.*

A moderate sized tree. *Leaves* 4–6 by 1¼–1¾ in., equally reticulated on both surfaces between the 16–20 pairs of arching nerves; petiole ⅔–1 in., much thickened at the base. *Panicle* tomentose throughout. *Flowers* much as in *M. indica*, the reflexed petals having 3 ridges. (*Fruit* as large as a hen's egg, subreniform, smooth, obtuse, yellow, sweet and acid, Kurz).—My specimens of this are imperfect; it is evidently very nearly indeed allied to *M. indica*, differing chiefly in the very fine reticulation of the leaves, as pointed out by Kurz. Wallich's *M. indica*, 8487 H. from Tavoy is possibly the same.

3. **M. pentandra,** *Hook. f.*; leaves oblong or oblong-lanceolate acuminate reticulated on both surfaces, panicle spreading tomentose, flowers crowded subsessile, petals 5 with 3 ridges, stamens 5 perfect, ovary smooth, style subterminal.

MALACCA, *Griffith, Maingay.*

A tree. *Leaves* 5–12 by 2–4 in., quite similar to those of *M. indica*, as are the panicles and flowers, except that Maingay describes the disk as more fully and fairly developed than in any form he had figured. The 5 stamens are all perfect and unequal. The petals are yellowish-white, with yellow brown ridges. Maingay figures the style as nearly terminal, and the ovule as quite laterally suspended.—The Malay name is 'Mam ploni,' which means mango ripened artificially.

4. **M. Griffithii,** *Hook. f. in Trans. Linn. Soc.* xxii. 168, *in note;* leaves small oblong or oblong-obovate obtuse reticulate between the nerves, inflorescence of many suberect compound pubescent racemes, petals 4 orbicular-oblong not much exceeding the sepals, stamen 1.

MALACCA, *Griffith.*

Branches stout. *Leaves* 3–5 by 1¼–2 in.; nerves about 10 pairs; base narrowed; petiole stout, ½ in. *Racemes* (branches of a reduced panicle), not much if at all longer

than the leaves, stout, finely pubescent. *Flowers* very small, ⅛ in. diam., subsessile. *Sepals* broadly ovate, tomentose. *Petals* orbicular-ovate, with 2 short or more confluent ridges. *Disk* with 5 or 6 subulate points. *Stamens* short.

5. **M. sclerophylla,** *Hook. f.;* leaves glabrous broadly elliptic with obtuse narrowed tips most thickly coriaceous base acute or rounded nerves obscure, petioles much thickened at the base, panicle pubescent of many erect stout spiciform branches, petals not much exceeding the sepals, stamen 1.

MALACCA, *Maingay.*

Branches very thick, woody, glabrous, angled, and channelled. *Leaves* 4–5 by 2–2½ in., alternate, not approximate at the ends of the branches, exceedingly thick and hard when dry,smooth on both surfaces; midrib strong; nerves about 10, faint; reticulations very obscure; petiole 1 in., of the upper leaves ¼ in., extremely thickened at the back especially, the thickening sometimes extending up the midrib. *Panicle* 4–6 in. long. *Flowers* sessile, $\frac{1}{10}$ in. diam.; bracts ovate. *Sepals* ovate, pubescent. *Petals* ovate-oblong, with 3 short ridges. *Disk* small. *Young drupe* nearly orbicular.—No other *Mangifera* has foliage at all like this.

†† *Panicle quite glabrous.*

6. **M. sylvatica,** *Roxb. Fl. Ind.* i. 644; leaves lanceolate or oblong-lanceolate usually long-petioled, panicle ample glabrous, branches slender, flowers pedicelled, petals 5 with 3 ridges, stamen 1 with no imperfect ones, ovary smooth, style lateral. M. indica, *Wall. Cat.* 8487 I.

TROPICAL NIPAL and SIKKIM HIMALAYA, *J. D. H.;* SILHET, *Roxb.*; KHASIA MTS., *H. f. & T.*; ANDAMAN ISLS., *Kurz.*

I am in some doubt about this plant, which is well figured in Roxburgh's drawings, but of which I have seen no flowering or fruiting specimen. I believe it to be a common tree in the Silhet, Khasia and Sikkim jungles, with usually longer more membranous young leaves than the Mango, and a more open lax perfectly glabrous panicle, and loose pedicelled flowers. Roxburgh contrasts it with the cultivated sorts as having a much larger panicle, with the numerous ramifications more erect and slender, flowers more completely monandrous, disk villous. The leaves he describes as in the common Mango. The drupe he figures as ovoid, gradually narrowed at the top into a sharp curved beak. Graham (*Cat. Bomb. Pl.*) states that is a native of the Bombay Ghats, but no one has confirmed this. Kurz's specimens, thus named from the Andaman Islands, have leaves 10–12 by 2½–3½ in., membranous, much reticulated, elliptic-lanceolate, acuminate, petiole very slender ¾–2 in.; nerves 16–20 pairs, slender, arched. I have gathered similar specimens in Sikkim and Silhet, with petioles 4 in. long, and Wallich's 8487 I. quite agrees with these. My Khasia ones, with slender branched panicles (as in Roxburgh's description and figure), but flowers all dropped, have leaves like those of *M. indica.* Kurz (*Journ. As. Soc. Beng.* 1870, ii. 75), observes that Miquel has incorrectly identified this plant with *M. indica,* from which it is at once distinguished by the very different white flowers, the disk and acuminated fruit.

7. **M. longipes,** *Griff. Notul,* iv. 419; leaves oblong- or elliptic-lanceolate acuminate faintly reticulate, panicle very lax spreading branches slender, flowers pedicelled, petals 5 narrow with one slender basal ridge branching into 5 nerves, stamen 1, imperfect ones minute.

MALACCA, *Griffith, Maingay.*

A tree. *Leaves* 6–10 by 1½–3 in., with 14–10 pairs of nerves, reticulation obscure above, more distinct beneath; petiole ¾–1½ in. *Panicles* usually longer than the leaves, branches widely spreading, pedicels ¼ in. *Flowers* ⅙–⅕ in. diam. *Sepals* ovate, subacute. *Petals* white, with yellow veins, very narrow, recurved. *Disk* broadly conical, papillose, 5-lobed. *Stamen* far exserted, filament elongated. *Ovary* smooth; style lateral, long, slender; ovule obliquely ascending.—This, as

Griffith remarks, is very near *M. sylvatica*, and as far as I can see may be a form of that plant, differing chiefly in the smaller disk and very narrow petals. Griffith describes the calyx and pedicels as puberulous, but I find no trace of this. The Malay name is 'Boa Pow.'—*Griffith.*

8. **M. zeylanica,** *Hook. f.;* leaves oblong-obovate oblong or elliptic-lanceolate obtuse or rounded at the tip reticulated, panicle glabrous stout narrow, sepals orbicular, petals 5 oblong with 5 ridges, stamen 1 with 6–8 minute subulate filaments, style subterminal. M. indica, *Thwaites Enum.* 75; Buchanania? zeylanica, *Blume Mus. Bot.* i. 185.

CEYLON; abundant up to an elevation of 3000 ft.

A tree, everywhere quite glabrous. *Leaves* small, 2–3½ by 1–1⅓ in., coriaceous, usually rounded at the tip, nerves 12–15 pairs, arching; petiole ¼–¾ in. *Panicle* stout, erect, much longer than the leaves. *Flowers* ⅙ in, diam.; pedicel slender. *Petals* short, elliptic-oblong, with 5 nerve-like ridges. *Disk* large. *Stamen* short. *Ovary* obscurely pubescent.—Thwaites identifies this specifically with the cultivated *M. indica*, but it appears to me to differ much in habit and foliage, in the contracted panicle, more pedicelled flowers, perfectly glabrous sepals, and short petals.

9. **M. gracilipes,** *Hook. f.;* leaves small elliptic-lanceolate acuminate obscurely reticulate, petiole very slender, inflorescence of many slender erect glabrous compound racemes, pedicels very slender, petals 5 lanceolate with 3–5 ridges, stamen 1 perfect slender with 4 short subulate filaments, style lateral.

MALACCA, *Maingay.*

A large tree, everywhere perfectly glabrous; branches very slender for the genus. *Leaves* 3–4 by 1–1½ in., undulate, much narrowed at both ends, nerves faint, arched; petiole remarkably slender, ¾–1 in., not much thickened at the base. *Racemes* (branches of a sessile panicle which start in a fascicle from the tips of the branches), long, very slender, much exceeding the leaves, and bearing short lateral branches throughout their length; pedicels very slender. *Flowers* about ⅙ in. diam. *Sepals* ovate, obtuse. *Petals* twice as long, pale green with purplish ridges. *Filament* slender, exserted. *Disk* rugose. *Ovary* quite smooth; ovule pendulous from a basal funicle.

10. **M. oblongifolia,** *Hook. f.;* leaves linear-oblong obtuse or subacute very coriaceous not reticulated beneath, petiole long, panicle large spreading quite glabrous, flowers pedicelled, petals 5 elliptic-oblong with a basal tubercle and 3–5 more or less confluent ridges, stamen 1 perfect with 4 shorter antheriferous ones, style subterminal.

MALACCA, *Griffith, Maingay* (cult.).

A very large tree, glabrous throughout; branchlets stout. *Leaves* 8–12 by 1½–2½ in., very coriaceous, with undulate margins, faintly reticulate above, not at all or very obscurely so beneath; base usually rounded; nerves 20–25 pairs. *Panicle* very large, branches widely spreading, 2–3-chotomously divided. *Flowers* distant, ¼ in. diam.; pedicel rather stout, ⅛–¼ in. *Sepals* veined. *Petals* rather short, yellow, ridges tipped with red. *Fruit* 4 in. long, ovoid, dull green.—Maingay, from whom this description of the fruit is taken, says that this is cultivated at Malacca as the Quenee Mango.

** Petals 4, with 1–5 free or confluent ridges that terminate in wart-like excrescences.

11. **M. quadrifida,** *Jack in Roxb. Fl. Ind. ed. Carey*, ii. 440; leaves elliptic-oblong or oblong-lanceolate obtuse narrowed into long petioles reticulate beneath inflorescence of many erect stout glabrous compound racemes, petals 4

short ovate with 3 short confluent ridges, stamen 1, the others reduced to minute teeth. *Wall. Cat.* 8489.

PENANG, *Jack;* MALACCA, *Maingay.*—DISTRIB. Sumatra.

A lofty tree, perfectly glabrous throughout; branchlets very stout. *Leaves* 4–8 by 1½–2 in., rarely acute, very coriaceous; nerves 15–20 pairs, reticulation above obsolete; petiole 1–2. in. *Racemes* equalling or exceeding the leaves, collected on a short peduncle, rachis stout, branchlets 1–6 flowered. *Flowers* small, ⅛ in. diam.; pedicel longer than the petals. *Sepals* broadly orbicular-ovate. *Petals* twice as long, pearly-white (Maingay); the ridges raised at their ends. *Stamens* very short, inserted on the disk. *Disk* tumid, 4-lobed. *Style* lateral. (*Drupe* roundish, becoming very dark-coloured, *Jack*).—Maingay in his MSS. describes the petals as 5, and stamens as usually 2, but I find the flower to be uniformly 4-merous and monandrous; Jack however states that a small superfluous fifth petal is sometimes placed within the rest. This is allied in flower and inflorescence to *M. Griffithii.*

12. **M. Maingayi,** *Hook. f.;* leaves elliptic-oblong acute or acuminate not reticulate on either surface or obscurely so beneath only, panicle glabrous spreading, flowers pedicelled, petals 4 oblong with 3–5 confluent ridges, stamen 1 perfect, the others reduced to teeth.

MALACCA, *Maingay.*

A tree, everywhere quite glabrous. *Leaves* 4–9 by 1½–3½ in., coriaceous, nerves 15–20 pairs, not strong, arched; petiole 1–2 in. *Panicle* equalling or exceeding the leaves, branches pale green (when dry), rather slender. *Flowers* ⅕ in. diam., pedicel slender. *Sepals* ovate, obtuse. *Petals* about twice as long. *Stamen* short. *Style* subulate, subterminal.—There appear to be two varieties of this in Maingay's Herbarium; one (called Sapoong or Sampong), with larger leaves not narrowed into the petiole, opaque above, with sunk nerves, tumid between the nerves; the other (marked as truly wild) with brown (when dry) more shining leaves, narrowed into the petiole, more reticulated beneath, and the nerves not sunk; its leaves are like those of *M. indica*, from which its glabrous pedicelled flowers and warted petals at once distinguish it; both differ from *M. quadrifida* in the inflorescence. The first variety has, according to Maingay, globose green fruit 3–4 by 2½–3 in.

13. **M. microphylla,** *Griff. MSS.;* leaves small elliptic acuminate reticulate beneath, panicle stout contracted puberulous, flowers very shortly pedicelled, sepals broadly ovate, petals 4 oblong with 3 ridges, stamen 1 without rudiments of others.

MALACCA, *Griffith;* in orchards.

A small tree (*Griffith*). *Leaves* 1½–4 by ¾–1½ in., shining above; nerves 8–10-pairs; petiole slender, ¼–½ in. *Panicle* short, stout, rather irregular, sometimes reduced to erect compound racemes, by the abbreviation of the peduncle and the branches being erect. *Flowers* about ⅕ in. diam., on short stout pedicels. *Sepals* pubescent. *Petals* about twice as long, the ridges distinct. *Filament* slender. *Style* lateral. *Fruit* oviform, green, very turpentiny, *Griffith.*—Griffith has what appears to be a small state of this, with small very shining leaves, quite polished on the upper surface.

SECT. 2. *Disk* narrow, often reduced to the form of a stalk to the ovary, rarely obsolete in the ♂ fl.

* *Petals free from the disk.*

14. **M. odorata,** *Griff. Notul.* iv. 417; leaves elliptic-lanceolate or oblong acute or acuminate-reticulate, panicle very stout with ascending stout branches glabrous, petals 5 linear-oblong reflexed from the middle with a thick branching ridge. M. fœtida, *var. δ. Miquel in Herb. Hook.*

MALACCA, *Griffith.*—DISTRIB. Java (Zollinger, 430).

A tree, everywhere quite glabrous, or very obscurely pubescent on the panicle. *Leaves* 6–12 by 2–4 in., very coriaceous, reticulate on both surfaces; nerves about 20-pairs, very strong; petiole stout, 1¼–1¾ in., much thickened from below the middle to the base. *Panicle* with stout green branches that turn black when dry. *Flowers* ¼ in. diam., odorous, flesh-coloured. *Sepals* ovate-oblong. *Petals* three times as long, reflexed, greenish, suffused with blood-red. *Perfect stamens* sometimes 2 (*Griffith*), the imperfect ones slender, subulate, capitate. *Ovary* glabrous. (*Drupe* oblong, stinking, yellow-green, with yellow spots, filled with a sticky gum; flesh yellow, fibrous, sweet, not turpentiny; stone compressed, fibrous; cotyledons rugose, equal at the base, one overlapping at the top. *Griffith.*)—Malay name "Koeene" or "Kohini," according to Griffith, which is the name Maingay gives to *M. oblongifolia* (a totally different plant). This much resembles *M. Parih*, Miq., of Java, which has a more effuse panicle with long tertiary branchlets and very long pedicels.

15. **M. lagenifera,** *Griff. Notul.* iv. 414, t. 567, f. 3; leaves small obovate-oblong or -spathulate obtuse or rounded at the tip, panicle large spreading pubescent, petals 5 linear-oblong obscurely thickened in the middle, stamens 5 perfect.

MALACCA, *Griffith, Cumming* (2330), *Maingay.*

A very lofty tree (*Griffith*); branchlets stout, with pale bark. *Leaves* 3–6 by 1¼–1¾ in., very thickly coriaceous, gradually narrowed into a very stout petiole ¾–1¼ in., not reticulate on either surface; nerves about 20 pairs, very faint, spreading and parallel. *Panicle* on a long and stout peduncle, much exceeding the leaves. *Flowers* ⅙ in. diam.; pedicels very short. *Sepals* many, orbicular, tomentose. *Petals* three times as long, concave, purple, erect till a late period. *Disk* a slender stipes. *Filaments* very slender (purple, alternating with short horns, *Maingay*). *Ovary* glabrous; style capillary, lateral. (*Drupe* pyriform, 4½ by 2½ in., pale green, with a pink blush, flesh livid or purplish flesh-colour; stone fibro-coriaceous, adherent to the membranous testa; radicle basal, very large. *Maingay.*)—Called Lanjoot by the Malays, according to Maingay and Griffith. The latter describes the drupe as smooth, glaucescent, fleshy, fetid, exuding a black varnish, traversed by innumerable fibres; stone ovate-lanceolate, fibro-coriaceous. *Seed* erect, adhering to the black tegument on the one side, on the other smooth; cotyledons with one half the surface smooth, the other wrinkled. Maingay describes the disk as hemispherical, but I do not find it so.

16. **M. fragrans,** *Maingay MSS.*; leaves very narrowly linear-oblong- or lanceolate acute acuminate or rounded at the tip, panicle spreading quite glabrous, petals narrow linear, stamens 5, one much longer than the others whose anthers are imperfect.

MALACCA, *Maingay.*

A tree, everywhere quite glabrous. *Leaves* much longer and narrower than in any other species, 6–10 by 1¼–1½ in., coriaceous, reticulated on both surfaces, margins waved, base acute abruptly contracted into a very slender petiole 1–2 in.; nerves 25–35 pairs, slender, almost horizontal. *Panicle* longer than the leaves, peduncle long and branches thick, black when dry. *Flowers* erect, almost ⅓ in. long; pedicel turbinate. *Sepals* unequal, ovate-lanceolate. *Petals* very narrow, erect, reflexed sharply from the middle, 1-nerved (Maingay), 3-nerved in a young state. *Disk* a slender pedicel. *Filaments* very slender, shorter than the capillary style, which is lateral. (*Drupe* obliquely broadly oblong-globose; flesh yellow, acid and terebinthine; stone thin, fibrous; testa coriaceous, *Maingay.*)—This in foliage approaches very closely Blume's *M. macrocarpa* of Java, which has still narrower leaves with crimped edges, 40 pairs of nerves, and a bitter-sweet fruit as large as a child's head.

** *Petals adnate to or inserted on the disk.*

17. **M. fœtida,** *Lour. Fl. Coch.* 160; leaves large elliptic-oblong or -obovate obtuse or acute not reticulate, nerves strong, panicle very stout glabrous

spreading, flowers subsessile, petals 5 linear-lanceolate 3-ridged inserted on the disk, stamens 5 one perfect the rest shorter imperfect. *Roxb. Fl. Ind. ed. Carey*, ii. 440; *Wall. Cat.* 8488; *Griff. Notul.* iv. 419. M. Horsfieldii & M. fœtida, *Miq. Fl. Ind. Bat.* i. pt. 2. 632.—*Rumph. Amb.* i. 98. t. 28.

MALACCA, PENANG, and SINGAPORE, *Jack*, &c.—DISTRIB. Throughout the Malay Archipelago.

A large tree; branchlets very stout. *Leaves* very large, 10–12 by 3–4 in., very coriaceous, pale when dry; surface raised above between the stout nerves, of which there are about 20 pairs; base acute; petiole stout, 1–2½ in. *Panicle* large, stout, with very spreading branches, and these again with short tertiary cymose branchlets (deep bloood-red, *Maingay*), black when dry. *Flowers* ½ in. diam., pink or dark red. *Sepals* ovate, obtuse. *Petals* reflexed from the middle, inserted on the pedicel-like disk above its base, but not decurrent on the disk. *Ovary* glabrous; style slender, lateral. (*Drupe* variable in form, not compressed, oblique, green, smooth, very fetid; flesh yellow, thick; stone almost 2-edged, chartaceous, fibrous; cotyledons equal, auricled at the base; radicle short. *Griffith.*)—Maingay describes the fruit as coarse-flavoured, and not unlike Lanjoot (M. lagenifera), stringy. Malay name Bachang or Bachong. Rumph and Loureiro describe the drupe as hairy, but no one else does so; possibly the fibres of the stone are alluded to by these authors.

18. **M. cæsia,** *Jack in Roxb. Fl. Ind. ed. Carey*, ii. 441; leaves cuneate-obovate or -oblong or -elliptic with very short thick petioles, panicle branched tomentose very stout, petals 5 erect adnate to the disk long narrow with one central ridge, stamen 1. *Griff. Notul.* iv. 415. M. fœtida, *Blume* (according to *Miquel in Herb.*).

MALACCA, *Maingay* (cult.).—DISTRIB. Sumatra, Java.

A large stately magnificent tree (*Griffith*); branchlets very stout. *Leaves* 6–16 by 2½–3½ in., very thickly coriaceous, smooth, rather shining, obscurely reticulated beneath, decurrent on the petiole, which is ¼–1 in.; nerves about 20–30 pairs, slightly arched. *Panicle* very stout and much branched (of a glaucous reddish colour, *Jack*). *Flowers* in dense heads on the tertiary branchlets, ⅓ in. long; bracts broad; pedicel very thick, short. *Sepals* short, broadly ovate, pubescent. *Petals* erect, adnate by the ridge to the disk, linear, concave, purple. *Disk* slightly lobed, *Imperfect stamens* reduced to mere teeth; filament of perfect one slender. *Style* lateral, slender. (*Drupe* oblong-obovate, reddish-white, *Jack.*)—Griffith says that the corolla is more connate with the disk in the female, and that the panicle is cream-coloured and petals white outside and lilac inside, and that the larger cotyledon alone is auricled.—Malay name Beenjai or Binjaee.

19. **M. superba,** *Hook. f.*; leaves very large subsessile cuneate-oblanceolate not reticulate, panicle spreading pubescent, flowers subcapitate very large, petals 5 lanceolate acuminate adnate to the disk with a flat central ridge, stamens 5, 1 perfect.

MALACCA, *Maingay.*

A gigantic tree (*Maingay*); branchlets as thick as the thumb. *Leaves* 10–16 by 3–5 in., very thickly coriaceous and hard, obtuse, narrowed below into the short very thick petiole, not reticulate; nerves about 35 pairs, spreading, not sharply defined but prominent, midrib very stout beneath. *Panicle* hoary-pubescent, probably 2 ft. long, peduncle very thick; primary branches strict, ascending, branched at the tips and there bearing heads of flowers two inches across; bracts large, concave. *Flowers* ¾ in. diam., lilac. *Sepals* hoary, ¼ in. long, ovate- lanceolate. *Petals* adnate to the torus by the central ridge, concave, recurved. *Filaments* all slender, one antheriferous. *Ovary* oblique; style slender, subterminal; ovule laterally attached, horizontal.—This is a grand species, allied to *M. cæsia*, but far larger in all its parts than any other of the genus. It is curious that no one but Maingay should have met with so conspicuous a tree. Large sheathing stipule-like scales occur amongst the leaves, whose nature I cannot ascertain.

20. **M. policarpa,** *Griff. Notul.* iv. 416 (polycarpa), t. 167, f. 2 (cæsia); leaves large sessile oblanceolate obtusely acuminate faintly reticulated undulate.

MALACCA, *Griffith.*

A large tree, like *M. fœtida*; branches stout. *Leaves* nearly 1 foot long, very coriaceous, nerves 20–30 pairs, arched; petiole ¼ in., winged, flattened. *Flowers* unknown. *Drupe* oblong, base rather broader, brown, dusty all over, of a strong Dorian or Mango taste; flesh and juice copious acid and pleasant; stone lanceolate, compressed, coriaceo-fibrous; embryo obclavate.—*Griffith*, from whom most of the above description is taken, says that this is the 'Camang,' and that he proposes for it the name of *Mangifera ?policarpa* (misprinted *polycarpa*, at p. 416 of the Notulæ), in allusion to the russet-coloured fruit, which is unique in the genus. Judging from the foliage, this is probably allied to *M. cæsia.*

DOUBTFUL SPECIES.

MANGIFERA. Pegu, *Kurz* n. 2021; leaves very like those of *M. fragrans* in shape and size and with equally slender petioles; but the nerves are far less numerous, about 20 pair, arched, very slender, and the under-surface is far less finely reticulate, pale brown and quite opaque.

MANGIFERA. Pegu, *Kurz* n. 2020; leaves 14–18 by 3½–4 in., narrowly elliptic-lanceolate acuminate membranous glaucous beneath, finely but not closely reticulate, nerves about 30 pair slender well defined slightly arched, petiole 2–4 in. very slender.—I give this as a *Mangifera* on Kurz's authority.

*3. ANACARDIUM, Rottb.

Shrubs or trees. *Leaves* alternate, petioled, simple, quite entire. *Panicles* terminal, bracteate. *Flowers* small, polygamous. *Calyx* 5-partite, segments erect, imbricate, deciduous. *Petals* 5, linear-lanceolate, recurved, imbricate. *Disk* filling the base of the calyx, erect. *Stamens* 8–10, all or some fertile; filaments connate and adnate to the disk. *Ovary* obovoid or obcordate; style filiform, excentric, stigma minute; ovule 1, ascending from a lateral funicle. *Nut* kidney-shaped, seated on a large pyriform fleshy body formed of the enlarged disk and top of the peduncle; pericarp cellular and full of oil. *Seed* kidney-shaped, ascending, testa membranous, adherent; cotyledons semi-lunar; radicle short, hooked.—DISTRIB. A small tropical American genus, of which one species is naturalised in Asia.

A. occidentale, *Linn.*; *DC. Prodr.* ii. 62; leaves obovate or obovate-oblong glabrous obtuse retuse or rounded at the tip, base rounded or cuneate. *Roxb. Fl. Ind.* ii. 312; *Wall. Cat.* 990; *Wight. & Arn. Prodr.* i. 168; *Grah. Cat. Bomb. Pl.* 40; *Dalz. & Gibs. Bomb. Flor. Suppl.* 18; *Griff. Notul.* iv. 408, t. 565, f. 3 *e. f.*; *Bedd. Fl. Sylv.* t. 163.—*Rheede Hort. Mal.* iii. t. 54.

Hotter parts of INDIA, especially near the sea. Naturalised from America. CEYLON.

A small tree; trunk short, thick, crooked. *Leaves* 4–8 by 3–5 in., hard; nerves about 10 pair, nearly horizontal; petiole ¼–½ in. *Panicles* 6–10 in., pubescent; branches long naked to the tips where the flowers are collected; bracts lanceolate, gibbous, hoary. *Flowers* ⅓ in. diam., yellow with pink stripes. *Stamens* usually 9, all fertile, one larger than the rest. *Fruit* 1 in., on a pyriform fleshy receptacle 2·3 inches long.—The Cashew-nut.

4. BOUEA, Meissn.

Trees. *Leaves* opposite, petioled, coriaceous, glabrous, quite entire. *Flowers* small, in axillary and terminal panicles, polygamous. *Sepals* 3–5, deciduous,

valvate. *Petals* 3–5, imbricate. *Disk* very small. *Stamens* 3–5, inserted within the disk, all fertile. *Ovary* sessile; style short, terminal, stigma obscurely unequally 3-lobed; ovule ascending from the wall of the cavity. *Drupe* fleshy; stone thin, fibrous, 1-celled, 1-seeded. *Seed* suberect; cotyledons fleshy; radicle very short, inferior.—DISTRIB. Species 5, natives of Tropical Asia and the Malay Archipelago.

1. **B. burmanica,** *Griff. Plant. Cantor* 14; leaves 5–7 in. elliptic-lanceolate obtusely acuminate, nerves 12–15 pairs, panicles obscurely puberulous lax-flowered, flowers 4–5-merous. B. oppositifolia, *Meissn. in Walp. Rep.* i. 556. B. Brandisiana, *Kurz in Journ. As. Soc. Beng.* 1871, ii. 50; 1873, ii. 66. Mangifera oppositifolia, *Roxb. Fl. Ind.* i. 640; *Hort. Bengh.* 18; *Wall. Cat.* 8490. Cambessedea, *Wt. & A. Prodr.* i. 170.

PEGU, TENASSERIM and the ANDAMAN ISLANDS.—DISTRIB. Java.

Leaves very coriaceous, pale; nerves above sunk, very slender, beneath raised with a slender incised line along the ridge. *Panicles* much shorter than the leaves, slender, spreading, lax, few-flowered. *Flowers* about $\frac{1}{8}$ in. diam., yellow, pedicelled, quite glabrous. *Sepals* rounded. *Petals* oblong, keeled on the face. *Stamens* usually 4. *Ovary* obliquely ovoid. *Drupe* 1–2 in., broadly ovoid, compressed, yellow, eatable.—'Mariam' or 'Mai-een' of the Burmese. Kurz states that the stamens are usually 8, perhaps a misprint for 3.

2. **B. microphylla,** *Griff. Plant. Cantor* 15; *Notul.* iv. 423; leaves $2\frac{1}{2}$–$3\frac{1}{2}$ in. elliptic-lanceolate obtuse or obtusely acuminate, panicles dense-flowered obscurely puberulous, flowers 4-merous. B. diversifolia, *Miq. Fl. Ind. Bat. Suppl.* i. 522. ? B. myrsinoides, *Blume Mus. Bat.* t. i. 204; *Miquel* l. c. i. pt. 2, 635.

MALACCA, *Griffith, Maingay.*—DISTRIB. Sumatra.

Very similar to *B. burmanica*, but much smaller in all its parts and usually triandrous.—'Roomaniya Paigo' of the Burmese.

3. **B. macrophylla,** *Griff. Plant. Cantor* 15; *Notul.* iv. 420, t. 567, f. 4; leaves 6–10 in. oblong-lanceolate obtuse or obtusely acuminate, panicle much branched dense-flowered very pubescent, flowers usually 3-merous. ? B. gandaria, *Blume Mus. Bot.* i. 204, *in note*; *Miquel Fl. Ind. Bat.* i. pt. 2, 635.

MALACCA, *Griffith, Maingay.*—DISTRIB. Java, Borneo.

A much larger plant than *B. oppositifolia*, with more oblong glossy leaves, the nerves 12–20 pairs sunk on the upper surface, raised on the lower but not grooved on the ridge. *Panicle* 2–3 in. long; branches stout, spreading horizontally and bearing densely crowded cymes of flowers about $\frac{1}{12}$ in. diam. *Sepals* 3 in the ♀ (*Griffith*). *Stamens* 3–5. *Drupe* ovoid oblong, a little oblique, as large as a hen's egg; pulp yellowish, acid, not terebinthine; stone leathery, fibrous, adherent to the testa. *Cotyledons* lilac, equal, reticulate, rugose (*Griffith*). 'Roomaniya Baitool' of the Malays.

5. GLUTA, Linn.

Trees with caustic juice. *Leaves* crowded at the ends of the branchlets, short-petioled, simple, oblong, coriaceous. *Panicles* axillary and terminal. *Flowers* small, hermaphrodite. *Calyx* spathaceous, bursting irregularly, caducous. *Petals* 4–6, adnate to the disk, imbricate. *Disk* elongate, rarely short. *Stamens* 4–6, inserted on the disk, filaments capillary. *Ovary* sessile on the disk or stipitate, oblique, 1-celled; style lateral, filiform, stigma simple; ovule 1, pendulous from a basal funicle. *Berry* stalked, dry, deformed, tubercled or ridged. *Seed* with the testa adherent to the pericarp and full of black juice; cotyledons large, connate, fleshy; radicle short, obtuse, incurved.—DISTRIB. About 8 species, all Malayan.

1. **G. elegans,** *Wall. in Roxb. Fl. Ind. ed. Carey*, ii. 315; *Cat.* 1003 (Syndesmis); leaves elliptic-lanceolate acuminate not reticulate above, petiole and nerves slender, panicles lax and flowers perfectly glabrous. Indeterminata, *Wall. Cat.* 9049.

PENANG, *Porter, Maingay.*

A small tree, perfectly glabrous throughout; much branched; trunk stout. *Leaves* 3–5 in., tapering at both ends, shining, reticulate beneath; nerves 8–12 pairs, arched; petiole $\frac{1}{4}$–$1\frac{1}{2}$ in. *Panicles* much shorter than the leaves, slender. *Flowers* $\frac{1}{2}$ in. long, subcorymbose. *Calyx* tubular, membranous, scarlet, split, mouth 2-toothed. *Petals* linear-lanceolate. *Disk* elongate. *Stamens* 4–5, as long as the petals. *Drupe* $\frac{3}{4}$ in. long, when dry, gibbous-oblong, smooth, style-scar nearer the base than top.—A most beautiful and fragrant tree.

VAR. *Helferi*; leaves linear-oblong obtuse, nerves more oblique. Tenasserim or Andaman Islands, *Helfer*.—Probably a different species.

2. **G. tavoyana,** *Wall. Cat.* 1004 (Syndesmis); leaves oblong-lanceolate obtuse acute or acuminate reticulate on both surfaces, petiole short, panicles long-peduncled puberulous. Syndesmis sp., *Griff. Notul.* iv. 410.

TENASSERIM, at Tavoy, *Gomez*; Mergui, *Griffith.*

A small tree with white branches. *Leaves* 4–12 by $1\frac{1}{4}$–3 in., very coriaceous, brown, rather waved; nerves 15–20 pairs, arched; petiole usually $\frac{1}{2}$ in., stout. *Panicles* slender; peduncle 1–3 in.; flowers loosely corymbose, like those of *G. elegans*, but smaller, about $\frac{1}{3}$ in. long; pedicel stouter; calyx (scarlet) shorter, puberulous, not toothed. *Petals* linear-spathulate, white.

3. **G. coarctata,** *Griff. Notul.* iv. 409, t. 567, f. 1 (Syndesmis); leaves recurved conduplicate short-petioled linear- or obovate-oblong obtuse or subacute reticulate on both surfaces, margins waved, panicles pubescent, flowers large.

MALACCA, *Griffith, Maingay.*

A small tree. *Leaves* 5–10 by 2–3 in., coriaceous, bright brown when dry; nerves 15–22 pairs, very slender; petiole $\frac{1}{6}$–$\frac{1}{3}$ in. *Panicles* much branched, 3–5 in.; flowers crowded at the tops of the branches, $\frac{1}{2}$ in. diam. *Calyx* short, almost campanulate, split and lobed, very pubescent. *Petals* 5, obovate-lanceolate tipped with red. *Stamens* 5. *Drupe* subglobose, with an irregular raised ridge round the base, others down the sides; rind dry, papillose, coriaceous; flesh white, fibrous and spongy; stone coriaceous, adnate to the testa. *Seed* erect; embryo very large, cotyledons subhemispheric unequal fleshy, opposite faces pink, radicle short.—The description of the fruit is taken from Griffith's Notulæ and figure. The recurved subsessile leaves and large flowers at once distinguish the species.

4. **G. travancorica,** *Bedd. Flor. Sylv.* i. t. 60; leaves subsessile small obovate-oblong rounded at the tip, panicles spreading tomentose, calyx cupular.

WESTERN PENINSULA; Ghats of Tinnevelly and Travancor, *Beddome.*

A very tall timber tree. *Leaves* 4–6 by $1\frac{1}{2}$–$1\frac{3}{4}$ in., coriaceous, reticulate on both surfaces but especially beneath; petiole very short, dilated. *Panicles* crowded, terminal and in the upper axils, subcorymbose, shorter than the leaves; bracts ovate, boat-shaped. *Calyx* truncate at the base, very short, coriaceous, irregularly toothed or lobed, split on one side, less deciduous than in the other species. *Petals* 5, elliptic-obovate, obtuse, downy on both surfaces. *Disk* very short. *Stamens* 5, filaments subulate. *Drupe* 1 in. diam., depressed-globose, stipitate.

6. **BUCHANANIA,** Roxb.

Trees. *Leaves* alternate, petioled, simple, quite entire. *Panicles* terminal and axillary, crowded. *Flowers* small, white, hermaphrodite. *Calyx* short,

3-5-toothed or -lobed, persistent, imbricate. *Petals* 4–5, oblong, recurved, imbricate. *Disk* orbicular, 5-lobed. *Stamens* 8–10, free, inserted at the base of the disk. *Carpels* 5–6, free, seated in the cavity of the disk, one fertile, the rest imperfect; style short, stigma truncate; ovule 1, pendulous from a basal funicle. *Drupe* small, flesh scanty; stone crustaceous or bony, 2-valved. *Seed* gibbous, acute at one end; cotyledons thick; radicle superior.—DISTRIB. A tropical Asiatic, Australian and Pacific Island genus; species about 20.

1. **B. latifolia,** *Roxb. Fl. Ind.* ii. 385; leaves usually broadly oblong rounded at the tip closely reticulate on both surfaces villous pubescent or glabrate beneath, panicle woolly or velvety, flowers crowded. *Wt. & Arn. Prodr.* i. 169; *Wall. Cat.* 983; *Bedd. Fl. Syl.* t. 165; *Dalz. & Gibs. Bomb. Fl.* 52; *Grah. Cat. Bomb. Pl.* 41; *Brandis For. Flor.* 127. Spondias elliptica, *Rottl.*

Hot, drier parts of INDIA, from KUMAON ascending to 1500 ft., and OUDH, through CENTRAL INDIA and to the WESTERN PENINSULA, BIRMA and TENASSERIM.

A tree 40–50 ft., subdeciduous; branchlets as thick as the finger. *Leaves* 6–10 in., very coriaceous or hard, nerves 15–20 pairs, stout, nearly straight; petiole $\frac{1}{4}$–$\frac{1}{3}$ in., stout, pubescent. *Panicles* terminal and axillary, shorter than the leaves, pyramidal, branches stout; bracts small, caducous. *Flowers* $\frac{1}{4}$ in. diam., sessile, greenish white. *Calyx* 5-toothed. *Petals* oblong. *Disk* fleshy. *Stamens* 10, spreading, as long as the petals. *Ovaries* one perfect, conical, pubescent, 4 others reduced to filaments. *Drupe* $\frac{1}{2}$ in., subglobose, slightly compressed, black; stone hard, 2-valved.—There is a specimen marked from Malacca in Griffith's Herbarium.

2. **B. angustifolia,** *Roxb. Fl. Ind.* ii. 386; *Cor. Pl.* iii. t. 262; leaves linear-oblong or elliptic or elliptic-lanceolate obtuse or rounded at the tip base not narrowed into the petiole glabrous on both surfaces, nerves very slender, panicles quite glabrous, flowers sessile. *Wall. Cat.* 982; *W. & A. Prodr.* 169; *Grah. Cat. Bomb. Pl.* 41; *Wight Ic.* t. 101. Spondias simplicifolia, *Rottl.* Mangifera axillaris, *Lamk.*

WESTERN PENINSULA; the Concan, from the Adjunta Jungles, *Graham*, southwards. CEYLON, in the northern parts of the island.

A tree, perfectly glabrous throughout, branchlets stout. *Leaves* 4–6 by $1\frac{1}{2}$–2 in., thinly coriaceous, shining above, delicately reticulate beneath, rounded or acute at the base; nerves 12–15 pairs, very slender; petiole $\frac{3}{4}$–$1\frac{1}{4}$ in., slender. *Panicles* axillary and terminal, about as long as the leaves, peduncle and branches slender, spreading. *Flowers* in small clusters $\frac{1}{8}$–$\frac{1}{6}$ in. diam., quite glabrous, nearly sessile. *Drupe* $\frac{1}{2}$ in. diam., obliquely spherical.—The Malayan and Australian forms referred to this appear to me to differ much in the leaf-base, narrowed into the shorter stouter peduncle, and other points.

3. **B. glabra,** *Wall. Cat.* 984; leaves broadly elliptic or oblong or almost orbicular obtuse or rounded at the tip quite glabrous, base rounded, nerves strong, panicle spreading puberulous, flowers sessile.

TENASSERIM; at Moulmein, *Wallich.*

A tree. *Leaves* 4–6 by 2–3 in., usually quite elliptic and rounded at both ends, sometimes more acute at the base, very coriaceous, upper surface raised between the nerves, faintly reticulate, lower strongly reticulate shining; nerves 12–15 pairs; petiole always short, $\frac{1}{2}$ in. *Panicle* shorter than the leaves, rusty puberulous, glabrate in fruit; branches spreading, rather stout. *Flowers* $\frac{1}{10}$ in. diam., rather crowded, very shortly pedicelled. *Fruit* unripe, glabrous.—Wallich's are the only specimens of this that I have seen; it is nearest *B. augustifolia*, but differs materially in the broad almost rounded leaves, very short petiole, and puberulous panicle.

4. **B. lucida,** *Blume Mus. Bot.* i. 184; quite glabrous throughout, leaves

obovate or obovate-oblong, tip rounded or obtuse reticulate on both surfaces narrowed into the petiole, panicles lax spreading, branches slender, flowers not crowded pedicelled. *Miq. Fl. Ind. Bat.* i. pt. 2, 636. B. palembanica, *Blume? Turcz. in Bull. Mosc.* 1858, pt. i. 473. Hypericinea angustata, *Wall. Cat.* 4830. B. subobovata, *Griff. Notul.* iv. 413.

EASTERN PENINSULA; from Tenasserim to Malacca, and Penang.—DISTRIB. Sumatra, Borneo, Australia?

A tree, quite glabrous throughout. *Leaves* 4–7 by $1\frac{1}{2}$–2 in., coriaceous, very brown when dry and rather shining; nerves 12–15 pairs slender, arched; petiole 1–$1\frac{1}{4}$ in., gradually dilated upwards. *Panicles* usually longer than the leaves, very many-flowered. *Flowers* $\frac{1}{8}$ in. diam. (4–5-merous, white, disagreeably-scented, *Griffith*). *Sepals* orbicular. *Petals* elliptic, obtuse. *Filaments* subulate, white. *Drupe* $\frac{1}{3}$ in. diam., orbicular, compressed with a sharp edge.—Blume's *B. arborescens*, and perhaps *B. longifolia*, are hardly distinct from this, as is Miquel's *petiolaris* and *bancana*. I should refer hither also the glabrous panicled Australian plant placed under *angustifolia*, Roxb., in the Flora Australiensis.

VAR. *intermedia*, leaves obovate-spathulate membranous. B. intermedia, *Wight Ic.* t. 81.—Naggarie hills, Madras.

5. **B. acuminata,** *Turcz. in Bull. Mosc.* 1858, i. 472; glabrous throughout, leaves long- or short-petioled obovate or oblanceolate abruptly acuminate, panicles spreading exceeding the leaves long-peduncled very slender lax-flowered, flowers pedicelled. B. sessilifolia, *Blume Mus. Bot.* i. 184. Hypericinea lucida, *Wall. Cat.* 4827. Terebinthacea, *Wall. Cat.* 8505.

TENASSERIM; at Moulmein, *Lobb*; PENANG, *Porter*; MALACCA, *Griffith, Maingay.* DISTRIB. Sumatra.

A small tree. *Leaves* 4–7 by 2–$2\frac{1}{2}$ in., thinly coriaceous, tips very acute, base much narrowed, reticulate on both surfaces, quite sessile in Penang specimens, with slender petioles sometimes $1\frac{1}{2}$ in. in Malacca and Tenasserim ones, bright brown when dry; nerves about 15 pairs, slender. *Panicles* chiefly axillary, branches divaricating. *Flowers* $\frac{1}{10}$ in. diam. *Sepals* small, orbicular. *Petals* oblong. *Filaments* compressed. *Drupe* as in *B. lucida.*—I think there is no doubt of Blume's *B. sessilifolia* being a sessile-leaved form of this, which is far more frequently a petioled plant, and therefore better fitted to Turczaninoff's name than to Blume's, though against the laws of priority.

6. **B. lanceolata,** *Wt. Ic.* t. 237; *Ill.* i. 185; leaves elliptic-lanceolate obtusely acuminate, petiole stout, panicles short pubescent, flowers crowded subsessile. Buchanania? acuminata, *Wall. Cat.* 981.

WESTERN PENINSULA; near Quilon, *Wight.*

A tree. *Leaves* 4–5 by $1\frac{1}{2}$–$1\frac{3}{4}$ in., reticulate and shining on both surfaces, margin waved, base acute but not contracted into the petiole; nerves 16–20 pairs, slender arched; petiole $\frac{1}{2}$–$\frac{3}{4}$ in., stout. *Panicles* shorter than the leaves, numerous, stout, axillary and terminal. *Flowers* $\frac{1}{8}$ in. diam., crowded on the short stout lateral branches. *Sepals* rounded. *Petals* broadly oblong. *Filaments* subulate. *Fruit* unknown.—Wallich's *B.? acuminata*, from Tavoy (Cat. 981), is very similar to this; it has fruit only, and the nervation is a little different.

DOUBTFUL SPECIES.

B. LANCIFOLIA, *Roxb. Fl. Ind.* ii. 386; 'a large tree, leaves lanceolate obtuse pointed lucid entire, panicles terminal.'—Chittagong.

B.? ACUMINATA, *Wall. Cat.* 981. See at end of 6. *lanceolata.* Tavoy, *Gomez*, in fruit only.

B. LAXIFLORA, *Kurz in Journ. As. Soc. Beng.* 1872, pt. 2, 304; 'leaves 6–7 in. ovate-oblong coriaceous finely tomentose glabrescent above, petiole $\frac{1}{2}$ in. stout, panicle terminal lax diffuse much branched hoary or yellowish pubescent, flowers minute,

pedicels short slender, bracts minute subulate, calyx hoary, lobes $\frac{1}{48}$ in. long oblong acute, petals $\frac{1}{12}$ in. obovate-oblong, filaments subpuberulous, ovary glabrous.'—Martaban, *Kurz.*

7. MELANORRHŒA, Wall.

Trees with a varnish juice. *Leaves* alternate, simple, quite entire, coriaceous. *Panicles* axillary. *Flowers* rather large, hermaphrodite. *Sepals* 5, cohering into a pointed cap, deciduous. *Petals* 5–8, linear-oblong, imbricate, much enlarged in fruit. *Disk* hemispheric or columnar. *Stamens* 5 or very numerous, inserted all over the disk; filaments capillary. *Ovary* stalked, lenticular, oblique, 1-celled; style sublateral, stigma simple; ovule 1, pendulous from a basal funicle. *Fruit* dry, subsessile on a long pedicel rising from the stellately spreading persistent petals, globose coriaceous. *Seed* subglobose or oblong; testa papery; cotyledons thick, plano-convex; radicle ascending.—The following are the only species.

* *Stamens many. Fruit pedicelled.*

1. **M. usitata,** *Wall. Pl. As. Rar.* i. 9. t. 11, 12: *Cat.* 597; leaves obovate or elliptic obtuse softly tomentose on both surfaces.

MUNNIPORE, BIRMA and TENASSERIM, *Wallich*, &c.

A large deciduous tree; branchlets very stout, velvety. *Leaves* 6–14 by 4–6 in.; base cuneate; nerves 28–30 pairs, stout, straight; petiole flattened, winged, $\frac{1}{4}$–1 in. *Panicles* 1 ft. long, peduncled, tomentose. *Flowers* lax $\frac{1}{2}$ in. diam.; pedicels slender. *Calyx* calyptriform, beaked, pubescent. *Petals* 5–6, eventually 2–4 in. long, linear-oblong, obtuse, coriaceous, reticulated, gland-dotted, pubescent. *Stamens* 20–30. *Drupe* the size of a cherry, red, glaucous; pedicel $\frac{1}{2}$ in.—The varnish tree.

2. **M. glabra,** *Wall. Plant. As. Rar.* iii. t. 283; *Cat.* 1005; leaves obovate-oblong or elliptic-lanceolate obtuse quite glabrous, nerves 16–20-pairs. Melanorrhœa, *Griff. Notul.* iv. 409.

TENASSERIM, at Tavoy, *Gomez;* Mergui, *Griffith.*

A tree; branchlets hoary. *Leaves* 6–10 in., undulate, coriaceous, shiningabove, reticulate on both surfaces; base cuneate; nerves 16–20-pairs, slender, arched, very different from *M. usitata;* petiole $\frac{1}{2}$ in. flattened, winged. *Panicles* lax, slender, sparingly branched, about equalling the leaves, puberulous. *Flowers* on slender pedicels, white, $\frac{1}{2}$ in. diam. *Calyx* membranous, calyptriform, acute pubescent. *Petals* linear-oblong, acute, puberulous, eventually 2–2$\frac{1}{2}$ in. long, linear-oblong or -spathulate, coriaceous, veined. *Drupe* $\frac{2}{3}$ in. diam., depressed or globose, quite smooth; pedicel very slender, 1–1$\frac{1}{4}$ in.

** *Stamens 5. Fruit subsessile.*

3. **M. Maingayi,** *Hook. f.;* leaves broadly elliptic obtuse long-petioled, quite glabrous.

MALACCA, *Maingay.*

A gigantic tree (*Maingay*); branchlets rather slender. *Leaves* 4–6 by 2–3 in., very coriaceous, deeply reticulate on both surfaces; nerves 18–20-pairs, strong-parallel; petiole 1–2 in. *Panicles* terminal and axillary, longer than the leaves, long-peduncled, pubescent, curved, lax-flowered. *Flowers* $\frac{1}{2}$ in. diam. *Calyx* calypitriform, membranous, veined, split on one side as in *Gluta*, pubescent. *Petals* linear, oblong, obtuse, tomentose. *Stamens* 5; filaments filiform, hairy. *Disk* elevated. *Ovary* tomentose. *Drupe* $\frac{1}{2}$ in., oblong, obtuse, smooth.

4. **M. Wallichii,** *Hook. f.;* leaves petioled broadly obovate tip rounded, nerves 12–14 pairs, panicles very numerous excessively branched very long softly tomentose. Stagmaria verniciflua, *Jack? Wall. Cat.* 980.

SINCAPORE, *Wallich*; MALACCA, *Maingay*.

A large tree. *Leaves* 6–8 by 3–4 in., coriaceous, obscurely reticulate above, more distinctly beneath; nerves strong, nearly straight; petiole 1–1½ in. *Panicles* terminal and in the uppermost axils, branched from the base, curved, a foot long and more, together forming a drooping mass of long arched finely pubescent angled (when dry) peduncles, that branch towards their ends into slender tomentose branchlets with innumerable softly downy flowers; bracts large, obovate, concave, very membranous. *Flowers* very shortly pedicelled, ¼ in. long. *Calyx* narrow-ovoid, very membranous, almost 2-valved. *Petals* linear-oblong, inserted towards the base of the disk, villous on both surfaces. *Stamens* 5. *Disk* short.—Wallich, who assumed this to be Jack's *Stagmaria verniciflua* (*Gluta Benghas*, L.), found a tree of it in the forest of Sincapore, close to Botany Hall, which, I assume, was his temporary residence.

8. SWINTONIA, Griff.

A tall tree, quite glabrous. *Leaves* alternate, long-petioled, simple, quite entire. *Panicles* terminal and axillary, very large and broad. *Flowers* small hermaphrodite or unisexual. *Calyx* small, 5-lobed, lobes rounded imbricate. *Petals* 5, adnate to the middle of the disk, linear-oblong, imbricate, much enlarged and reflexed in fruit. *Disk* short or elongate or cylindric. *Stamens* 5, inserted on the top of the disk, free. *Ovary* sessile, ovoid, 1-celled, narrowed into the slender style; stigma capitellate; ovule pendulous from a basal funicle. *Drupe* ovoid, smooth, sessile, coriaceous, subtended by the 5 reflexed enlarged petals. *Seed* erect, testa thin; cotyledons amygdaloid.—DISTRIB. The following are the only species known.

1. **S. Griffithii,** *Kurz in Jour. Beng. As. Soc.* 1870, ii. 75; leaves elliptic-lanceolate acuminate at both ends, petiole long slender, panicle much larger than the leaves lax spreading quite glabrous, branches very slender, flowers pedicelled. Swintonia, *Griff. in Proc. Linn. Soc.* 1846, 283. Astropetalum 1, *Griff. Notul.* iv. 411, t. 565, f. 2, *b. c. d.*

TENASSERIM, at Mergui, *Griffith*; *Helfer*.

A lofty tree, glabrous throughout; branchlets very slender. *Leaves* 4–7 by 1–1½ in., sometimes subopposite or 3-nate; tip obtuse; margin waved, obscurely reticulate above and beneath; nerves 16–20-pairs, very slender; petiole 1⅓ in. *Panicle* copiously branched from near the base. *Flowers* long-pedicelled, ⅓ in. diam. *Petals* linear-oblong, quite glabrous, rapidly enlarging. *Fruit* unknown.—I do not find the irregular pellucid dots which Griffith describes. Habit of a Mango, conspicuous for its dense masses of flowers which, when bruised, emit a peppery smell.

2. **S. Helferi,** *Hook. f.*; leaves narrow-lanceolate obtusely acuminate, base acute, margins undulate, petiole long slender, panicles much longer than the leaves lax spreading quite glabrous, flowers pedicelled.

TENASSERIM or ANDAMAN ISLANDS, *Helfer*.

Very nearly allied to *S. Griffithii*, but branchlets stouter. *Leaves* much longer, 6–10 by 1–1½ in., drawn out into longer points, with more numerous (25–30) pairs of nerves, rather stouter petioles, and more waved margins; they are also of a dark brown colour when dry, whereas those of *S. Griffithii* are pale greyish-brown. *Drupe* (ripe) obovoid, ½ in. The reflexed petals 2 in. long, linear, obtuse, veined, glabrous.

3. **S. Schwenkii,** *Teysm. & Binnend. Cat. Hort. Bogor.* 230; leaves oblong-lanceolate tip obtuse rounded or obtusely acuminate, base rounded glaucous beneath, petiole very slender, panicles excessively branched longer or shorter than the leaves, flowers minute subsessile. *Kurz in Journ. As. Soc.*

Beng. 1870, ii. 75. Anauxanopetalum Schwenkii, *Teysm. & Binnend. in Miquel Journ.* i. 368. Astropetalum 2, *Griffith, Notul.* iv. 415.

MALACCA, *Griffith; Maingay.*—DISTRIB. Sumatra.

A tall tree; branchlets rather slender. *Leaves* 3–5 in., usually obtusely acuminate, rather thin; margins hardly undulate; nerves about 15-pairs; petiole very slender, 2–2½ in. *Panicles* numerous from the upper axils, branched, peduncles and branches and pedicels excessively slender and spreading. *Flowers* the smallest of the genus, when first expanded, $\frac{1}{20}$ in. diam., shortly pedicelled. *Calyx-lobes* orbicular, glabrous. *Petals* oblong on expansion, very rapidly enlarging, finally 2½ in. long, linear, obtuse coriaceous, veined. *Drupe* ¾ in long, oblong, smooth. *Cotyledons* oblong, amygdaloid; radicle lateral, minute. — Kurz refers to this Astropetalum 1 of Griffith's Notulæ, which, as it appears to me from Griffith's notes and specimens, is his original *Swintonia*, to which he attached the MS. name of *S. floribunda*, but for which I have adopted Kurz's *S. Griffithii*. The reference to "Cat. Hort. Begor." is taken from Kurz. I do not find the name in the edition of that work at Kew.

4. **S. spicifera,** *Hook. f.;* leaves obovate or elliptic-obovate tip rounded base cuneate, panicles longer than the leaves branches strict, flowers forming pubescent spikelets at the tips of the branchlets.

PENANG ? *Maingay.*

A lofty thick-stemmed tree (*Maingay*). *Leaves* 3½–7 by 1½–2 in., coriaceous, upper surface shining with very obscure nerves, under glaucous with 12–15 pairs of very slender nerves, reticulation very indistinct; petiole ¾–1 in. *Panicles* subcorymbose, sometimes leafy, repeatedly trichotomously forked; branches angular, strict, suberect, glabrous, articulate, ultimate divisions ½ in., stout, clothed with imbricating small bracts and flowers; rachis with close-set deep scars; bracts orbicular, concave, pubescent. *Flowers* ⅛ in. diam. when first expanded, apparently polygamous, most of them males and caducous; pedicel very short. *Calyx* hemispheric, 5-lobed, lobes orbicular, pubescent. *Petals* 5, oblong, obtuse, hoary, eventually 1–2½ in., reflexed, linear-oblong, obtuse, coriaceous in fruit. *Stamens* 5, filaments subulate; anthers oblong. *Disk* confluent with the thickened base of the filament in the male. *Drupe* ¾ in. long, obliquely ovoid, smooth; pericarp thin. *Cotyledons* amygdaloid.—I assume this to be a Penang plant from the tickets and writing being of the same kind as is attached to Maingay's other Penang plants. A very different species from the rest, the imbricating flowers on the thick tips of the branchlets of the panicle is a curious character.

9. SOLENOCARPUS, Wt. & Arn.

A tree. *Leaves* crowded at the ends of the branches, odd-pinnate; leaflets opposite, glabrous, crenulate. *Panicles* terminal. *Flowers* small, hermaphrodite. *Calyx* small, 5-toothed, imbricate, deciduous. *Petals* 5, ovate, valvate. *Disk* broad, annular. *Stamens* 10, inserted at the base of the disk. *Ovary* sessile, 1-celled, style clavate, stigma obliquely truncate; ovule 1, pendulous from the top of the cell. *Drupe* small, obliquely oblong, truncate, compressed; pericarp cellular, full of oil. *Stone* hard. *Seed* linear, compressed; cotyledons linear, plano-convex; radicle very short, superior.

1. **S. indica,** *Wt. & Arn. Prodr.* i. 171; *Beddome Fl. Sylv.* t. 233; *Anal. Gen.* 79.

WESTERN PENINSULA; Malabar and Travancor, ascending to 2500 ft. on the Anamally hills, *Beddome.*

Leaves 6–12 in.; petiole angled, slender, pubescent; leaflets 4–6-pairs, 2–4 in., subopposite, sessile, except the terminal, which is long-petiolulate, oblong or oblong-lanceolate acuminate; base obliquely cordate, quite entire or remotely crenate, rather coriaceous, glabrous, nerves 8–10-pairs, faint. *Panicles* much branched; branches erect.

patent, pubescent, at length glabrate. *Flowers* shortly pedicelled, $\frac{1}{6}$–$\frac{1}{5}$ in. diam. *Drupe* $\frac{1}{4}$ in. long, pedicelled.

10. **TAPIRIA,** Juss.

Erect or scandent shrubs or trees. *Leaves* alternate, odd-pinnate; leaflets numerous, subopposite, serrate. *Panicles* axillary and terminal. *Flowers* small, green, polygamous. *Calyx* 5-partite; segments imbricate, persistent. *Petals* 5, small, oblong, imbricate. *Disk* broad, 5-lobed. *Stamens* 10, inserted at the base of the disk; anthers globose. *Ovary* in the ♂ immersed in the disk, 4–5-lobed, with 4–5 styles; in the ♀ ovoid, more free, 1-celled; style short, conic, stigma simple; ovule pendulous from the top of the cell. *Drupe* obliquely oblong, fleshy; stone rugose, crustaceous. *Seed* oblong, testa membranous; cotyledons large, plano-convex; radicle superior.—DISTRIB. Species 8 or 10, chiefly American.

1. **T. hirsuta,** *Hook f. in Benth & Hook. f. Gen. Plant.* i. 423; Robergia hirsuta, *Roxb. Fl. Ind.* ii. 455; Pegia nitida, *Coleb. in Trans. Linn. Soc.* xv. 364; Phlebochiton, *Wall. in Trans. Med. & Phys. Soc. Calc.* vii. 230; P. extensum, Cat. 8499.

CENTRAL and EASTERN tropical HIMALAYA, from Nipal and Sikkim, ascending to 4000 ft.; to Bhotan, *Griffith*. ASSAM, SILHET, and CHITTAGONG.

A scandent shrub, more or less clothed with soft villous tomentum. *Leaves* 8–12 in.; petiole villous, slender; leaflets petiolulate, 5–7 pairs, 1–4 in., oblong, acuminate, membranous, rarely quite entire, base cordate. *Panicles* villous; bracts ovate. *Flowers* $\frac{1}{16}$ in. diam., pale, sweet-scented. *Drupe* the size of a currant, black; flesh next the stone cellular and full of viscid brown balsam.

11. **PENTASPADON,** Hook. f.

Trees. *Leaves* odd-pinnate; leaflets opposite subsessile, quite entire. *Panicles* axillary, peduncled, branched, branchlets very slender. *Flowers* pedicelled, minute, hermaphrodite. *Calyx-lobes* 5, imbricate. *Petals* 5, oblong-obovate, strongly imbricate. *Stamens* 5, minute, inserted at the base of the disk, alternate with 5 short subulate staminodes which are free or adnate to the side of the disk, filaments short, broadly subulate; anthers didymous. *Disk* cupular, obscurely 10-lobed. *Ovary* seated on the disk, very minute, 1-celled, contracted into a stout short style, stigma globose or obliquely oblong, large; ovule 1, pendulous from the upper part of the cavity.

1. **P. ? velutinus,** *Hook. f.*; petioles leaflets beneath and panicles clothed with velvety tomentum.

MALACCA, *Maingay*.

Branchlets stout, woody, cylindric, covered with close-set scars of fallen leaves, tips velvety. *Leaves* crowded at the ends of the branches; petiole 6–10 in. stout, cylindric, velvety, bearing no leaflets on the lower third or fourth; leaflets 2–3$\frac{1}{2}$ in. subsessile except the petiolulate terminal one, oblong, acute or acuminate, base rather oblique and rounded, thinly coriaceous, opaque above with pubescent midrib, thickly tomentose beneath; nerves 12–14 pairs, slender, arched. *Panicles* usually shorter than the leaves, triangular, densely velvety, except the flowers, peduncle 2–4 in.; branchlets very numerous, erecto-patent, strict, very slender indeed, much divided and spreading. *Flowers* $\frac{1}{18}$ in. diam. on short glabrous pedicels; bracts minute. *Calyx lobes* ovate. *Petals* spreading, minutely puberulous. *Stamens* and *Ovary* very minute, as compared to the petals. *Drupe* 1 in. long, rather scurfy outside, compressed, ovoid, obliquely beaked, 1-celled; pericarp cellular and full of black varnish, endocarp thin.

Seed pendulous, oblong, compressed; testa thin; cotyledons thin, flat; radicle superior.—Maingay notes that this tree is polygamo-diœcious, but all the flowers I have examined seem to be hermaphrodite. Owing to the minuteness of the parts of the flower he states he was unable to make out the structure of the ovary and ovules. That I have given is, I think, correct.

The genus *Pentaspadon* was founded on a Bornean plant (Trans. Linn. Soc. xxiii. 168 t. 24), afterwards published from Sumatran specimens as *Nothoprotium* by Miquel (Fl. Ind. Bat. Suppl. 527), who referred it to *Burseraceæ*. Miquel's description is most imperfect, and I added to it in the Genera Plantarum the character of having two styles, taken from flowers sent to me by Miquel as belonging to his plant, but which prove to belong to a totally different one. Marchand (Rev. Anacard. 90, 183) was the first to identify *Nothoprotium* with *Pentaspadon*, and his identification I have confirmed by specimens subsequently received from Miquel. The fruit of the original species being unknown, it is possible that that here described may not be congeneric.

12. **ODINA,** Roxb.

Trees with few stout soft branches. *Leaves* few at the ends of the branches, alternate, odd-pinnate, deciduous; leaflets opposite, quite entire. *Racemes* simple and panicled, terminal, fascicled. *Flowers* small, monœcious or diœcious, fascicled, shortly pedicelled. *Calyx* 4–5-lobed, persistent; lobes rounded, imbricate. *Petals* 4–5, imbricate. *Disk* annular, 4–5-lobed. MALE FL. *Stamens* 8–10, inserted within the disk. *Ovary* 4–5 parted. FEM. FL. *Ovary* sessile, oblong, 1-celled; styles 3–4, stout, stigmas simple or capitellate; ovule pendulous from near the top of the cell. *Drupe* small, compressed, reniform, crowned by the distant styles; stone hard. *Seed* compressed; embryo curved, cotyledons flat fleshy, radicle superior. DISTRIB. About 12 species, of which most are African.

1. **O. Wodier,** *Roxb. Fl. Ind.* ii. 293; *W. & A. Prodr.* i. 171; *Thwaites Enum.* 78; *Grah. Cat. Bomb. Pl.* 42; *Wt. Ic. t.* 60; *Bedd. Fl. Sylv.* t. 123; *Wall. Cat.* 8475; *Royle Ill. t.* 31; *Dalz. & Gibs. Bomb. Fl.* 51; *Brandis For. Flor.* 123.—*Rheede Hort. Mal.* iv. t. 32.

Throughout the hotter parts of India, from the extreme N.W. and along the foot of the Himalaya (ascending to 4000 ft.) to ASSAM, BIRMA, TENASSERIM, the ANDAMAN ISLANDS, and CEYLON.

A deciduous ugly tree 40–50 ft.; trunk very thick; branches few; bark exfoliating; young parts clothed with stellate down. *Leaves* 12–18 in.; petiole terete; leaflets 3–4 pairs, petiolulate, 3–6 in., oblong-ovate, caudate-acuminate, quite entire. *Racemes* slender, ♂ compound, ♀ simple pubescent. *Flowers* 4-merous, fascicled, shortly cymose, inodorous; bracts ciliate. *Sepals* obtuse, ciliate. *Petals* twice as long, oblong, spreading, purplish and greenish-yellow. *Stamens* equalling the petals in the ♂. *Drupe* red.—The tissues abound in starch, whence it is most easy to increase this tree by cuttings of almost any part.

13. **PARISHIA,** Hook. f.

Beautiful flowering trees. *Leaves* alternate, odd-pinnate; leaflets numerous, quite entire, coriaceous. *Panicles* ample, nodding. *Flowers* diœcious. MALE. *Calyx* cupular, 4-lobed; lobes ovate, valvate. *Petals* 4, oblong, imbricate. *Disk* short, annular, obscurely 4-lobed. *Stamens* 4, inserted below the margin of the disk. *Rudimentary* ovary columnar. FEM. FL. *Calyx* 4-lobed, lobes greatly enlarged in fruit. *Petals* 4. *Disk* ? *Stamens* 4? *Ovary* sessile, ovoid, 1-celled; style terminal, unequally 3-fid, stigmas capitate; ovule pendulous from near the top of the cell. *Fruit* dry, globose, pubescent, pointed by the style-base, pericarp thin. *Seed* pendulous, testa membranous; cotyledons amygdaloid; radicle superior.—DISTRIB. The following are the only species.

1. **P. insignis,** *Hook. f. in Trans. Linn. Soc.* xxiii. 170, t. 26; leaflets 6–8 pairs, thinly coriaceous, ovate-cordate or -oblong oblique glabrous beneath, fruiting sepals 3–3½ in. Astronium insigne, *Marchand Rev. Anacard.* 177.

TENASSERIM, at Mergui, *Griffith*; ANDAMAN ISLDS., *Parish, Kurz.*

Leaves 1–2 ft., petiole cylindric, glabrous; leaflets petiolulate, 5–8 in., variable in shape, often gradually narrowed to the tip from just above the base, shining above, reticulated beneath; midrib quite excentric; nerves 12–20 pairs, slender, arched. *Panicles* as long as the leaves, villous with spreading hairs. *Flowers* ¼ in. diam., broadly campanulate. *Sepals* pubescent. *Disk* tomentose. *Drupe* the size of a large pea, globose, pointed, tomentose; enlarged sepals puberulous, acute or rounded at the tip.

2. **P. Maingayi,** *Hook. f.*; leaflets 10–12 pairs, thickly coriaceous oblong or linear-oblong obtuse puberulous beneath, fruiting sepals 6–7 in.

MALACCA, *Maingay.*

A tree abounding in a resinous slightly viscid secretion (*Maingay*). *Leaves* crowded at the ends of the branches; petiole 12–18 in., pubescent woody terete; leaflets 3–5 in., shortly petiolulate, base rounded, hard, shining above, with obscure nerves; beneath minutely puberulous, and minutely reticulated; nerves 15–30 pair, slender, spreading, nearly straight. *Panicles* apparently shorter than the leaves, pubescent. *Petals* linear-oblong. *Disk* pilose. *Young fruit* densely clothed with hispid ferruginous bristles; fruiting sepals puberulous, nearly 1 in. broad, tip rounded.—I have assumed that the fruits belong to the leaves of the plant with which Maingay has placed them; but in one of his Herbarium specimens, the leaves of *P. Maingayi* are fastened down with the fruit of a species with pubescent pericarp and acute fruiting sepals 4½ by 1½ in.

3. **P. pubescens,** *Hook. f.*; leaflets 5 pair thickly coriaceous oblong acute or acuminate pubescent beneath, fruiting sepals 5 in.

MALACCA, *Maingay.*

A lofty tree. *Leaves* 8–14 in.; petiole pubescent, terete; leaflets 3–5 in., subsessile, base rounded, above glabrous except the midrib, shining, beneath lurid thickly pubescent much reticulate; nerves 10–12 pairs, very strong, arched. *Panicle* divided to the base into numerous fascicled branches, densely softly tomentose. *Flowers* ½ in. diam., pedicelled. *Ovary* conical, pilose; styles 3. *Drupe* ½ in. long, between conical and spherical, densely tomentose. *Pericarp* cartilaginous; fruiting sepals ½ in. diam., tip rounded.

14. **SEMECARPUS,** Linn. f.

Trees. *Leaves* alternate, simple, quite entire, coriaceous. *Flowers* small, polygamous or diœcious, in terminal, rarely axillary panicles. *Calyx* 5–6-fid, segments deciduous. *Petals* 5–6, imbricate. *Disk* broad, annular. *Stamens* 5–6, inserted at the base of the disk, imperfect in the ♀ flowers. *Ovary* 1-celled; styles 3; ovule pendulous from a basal funicle. *Drupe* fleshy, oblong or subglobose, oblique, seated on a fleshy receptacle formed of the thickened disk and calyx base; pericarp loaded with acrid resin. *Seed* pendulous, testa coriaceous, inner coat somewhat fleshy; embryo thick, cotyledons plano-convex, radicle superior.—DISTRIB. About 20 species, tropical Asiatic and Australian.

* Leaves more or less pubescent beneath. Panicles pubescent (see also 7. *S. marginata*).

1. **S. Anacardium,** *Linn. f.*; leaves very large oblong or obovate-oblong tip rounded, base rounded cordate or cuneate opaque above brown minutely pubescent beneath, panicle tomentose, drupe 1 in. *Roxb. Flor. Ind.*

ii. 83; *Cor. Pl.* i. t. 12; *W. & A. Prodr.* i. 168; *Wt. Ic. t.* 558; *Grah. Cat. Bomb. Pl.* 41; *Dalz. & Gibs. Bomb. Fl.* 52; *Bedd. Fl. Sylv.* t. 166; *Brandis For. Flor.* 124; *Wall. Cat.* 8473. S. latifolius, *Pers.* (*ex Marchand*). Anarcardium latifolium, *Lamk. Ill.* t. 208. A. officinarum, *Gærtn.*

TROPICAL OUTER HIMALAYA, from Sirmore to Sikkim, ascending to 3500 ft.; and throughout the hotter parts of India, as far east as Assam (absent in the Eastern Peninsula and Ceylon).—DISTRIB. Eastern Archipelago and N. Australia.

A moderate-sized diœcious deciduous tree, exuding a dark juice; young parts petioles leaves beneath and panicle clothed with a fine pale pubescence. *Leaves* 9–30 by 5–12 in., very coriaceous, flat, margin cartilaginous, rarely linear-oblong, usually contracted below the middle; nerves 16–25 pairs, stout, slightly arched; petiole 1–2 in., rounded, not winged. *Panicle* equalling or shorter than the leaves, stout; branches spreading; bracts lanceolate. *Flowers* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., subsessile, fascicled. *Petals* much longer than the calyx, oblong, greenish-white. *Filaments* subulate. *Drupe* 1 in. long, obliquely ovoid or oblong, smooth, shining, black; cup orange-red.

VAR. *cuneifolia*; DC. Prodr. ii. 62; leaves cuneate at the base often tomentose beneath. Tropical Himalaya, Khasia Mts., Behar, and the Concan.—S. cuneifolia, *Roxb. Fl. Ind.* ii. 86; *Grah. Cat. Bomb. Pl.* 41.

2. **S. microcarpa,** *Wall. Cat.* 989; leaves large obovate or subpanduriform tip rounded base acute obtuse or rounded glabrous and opaque above pale with fine subscabrid pubescence beneath, drupe $\frac{1}{3}$ in.

BIRMA; on the Irawaddy, *Wallich.*

Very similar in habit and foliage to *S. Anacardium*, but the drupes are less than half the size.—Kurz's *S. albescens* (see p. 35), which he describes as having the petals valvate or subvalvate, a glabrous disk, pubescent ovary and 3 thick styles; found in the Moung forests, Pegu, by Dr. Brandis, may possibly be this.

3. **S. pubescens,** *Thwaites Enum.* 77; leaves lanceolate finely acuminate under surface and petiole velvety-tomentose nerves nearly straight, panicles slender velvety, drupe $\frac{1}{3}$ in.

CEYLON, at Ratnapoora, *Walker, Thwaites.*

A small tree (*Thwaites*). *Leaves* 6–12 by 2–2$\frac{1}{2}$ in., opaque and glabrous above except the pubescent midrib, densely clothed with rusty brown tomentum beneath, base acute or rounded; nerves 16–20 pairs, somewhat arched; petiole $\frac{1}{2}$–1 in. *Panicle* with very spreading branches. *Flowers* glabrous. *Drupe* oblong, slightly oblique, as broad as the short cup.

4. **S. Thwaitesii,** *Hook. f.*; leaves lanceolate finely acuminate under surface and petiole laxly pubescent or glabrate nerves much arched, panicles glabrate.

CEYLON, at Morowe Corle, *Thwaites.*

This, which is regarded by Thwaites as a glabrous form of *S. pubescens*, seems to me to be at once distinguished not only by the different pubescence, but by the much arched nerves.

** Leaves glabrous on both surfaces. Panicles glabrous.

5. **S. travancorica,** *Bedd. Flor. Sylv.* t. 232; leaves very large oblong or obovate-oblong thickly coriaceous, shining and reticulate on both surfaces, tip rounded, base rounded or acute, petiole 2 in.

WESTERN PENINSULA; Travancor Ghats, alt. 2–3000 ft., *Beddome.*

A very large tree. *Leaves* 12 by 5–6 in., occasionally lanceolate and acuminate, very coriaceous, dark green and shining above, paler beneath; nerves 16–18 pairs, much reticulated beneath; petiole 2 in. *Panicles* axillary and terminal, compound, spreading, about equalling the leaves. *Flowers* diœcious, 5–6-merous. *Calyx* pubes-

cent, and ciliate, ♂ with a large turbinate rudiment of an ovary. *Drupe* 1 in., obliquely oblong, rounded at the tip; cup broad, short. *Beddome.*

6. **S. auriculata,** *Beddome Fl. Sylv.* under t. 232; *Ic. Plant. Ind. Or.*, t. 187; leaves sessile oblanceolate tip obtuse reticulate on both surfaces nerves strong beneath.

WESTERN PENINSULA; Travancor and Tinnevelly Mountains, *Hayne, Beddome.*

A good-sized diœcious tree. *Leaves* 7 by $1\frac{3}{4}$ in., oblanceolate, obtusely acuminate, very gradually narrowed at the base and there furnished with 2 rounded lobes just above the petiole, dull green, glabrous, midrib slightly rusty, margin membranous, reticulations prominent beneath; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Flowers* ♂ 3–5-merous. *Drupe* obliquely obovate, $\frac{1}{2}$ in. diam., broader than long, very oblique; cup short, broad.—*Beddome.*

7. **S. marginata,** *Thwaites Enum.* 77; leaves 6–14 in. elliptic-obovate or oblanceolate abruptly obtusely acuminate glabrous or pilose beneath, base contracted auricled margin broadly cartilaginous, petiole very short and thick, panicle from the old wood glabrous or pilose, nut $\frac{1}{4}$ in.

CEYLON; damp forests in the Galle, Ratnapoora and Ambagamowa districts, *Walker, Thwaites.*

An erect shrub, 6–8 ft., sparingly branched. *Leaves* $2\frac{1}{2}$–5 in. broad, bright brown when dry, but hardly shining, white margin $\frac{1}{16}$ in. broad, reticulate beneath; nerves about 12 pairs, slender, arched; midrib grooved beneath; petiole $\frac{1}{4}$ in., remarkably thick. *Panicle* short, slender. *Nut* ovoid, subcompressed, oblique, reddish; cup half as long, scarlet.—Described chiefly from Thwaites, who states that there is a form with the leaves beneath clothed with spreading rigid hairs.

8. **S. obovata,** *Moon Cat.* 22; leaves 3–7 in. subsessile very broadly obovate or oblong thickly coriaceous shining on both surfaces, tip rounded or retuse, base cordate, panicles quite glabrous. *Thwaites Enum.* 77.

CEYLON; at Caltura and Ratnapoora.

A moderate-sized tree, glabrous throughout. *Leaves* $2\frac{1}{2}$–$3\frac{1}{2}$ in. broad, very thick, dark brown above when dry, paler beneath, reticulated on both surfaces, but the nervules not well defined; nerves 6–8 pair; petiole $\frac{1}{8}$ in. *Panicles* rather slender, branches spreading. *Flowers* minute. *Unripe nut* oblong, with a rather elongate narrow cup.

9. **S. Moonii,** *Thwaites Enum.* 77; leaves 6–12 in. oblong or oblong-lanceolate shortly acuminate thickly coriaceous many-nerved much reticulate beneath, petiole very short, panicle terminal large spreading.

CEYLON, south part of the island, *Thwaites.*

A moderate-sized perfectly glabrous tree. *Leaves* $2\frac{1}{2}$–$3\frac{1}{2}$ in. broad, hard, rather shining grey-green above, with distinct and rather broad reticulations, which are stronger on the brown undersurface; nerves 18–20 pairs, very spreading, shining beneath, with the midrib grooved; petiole $\frac{1}{10}$–$\frac{1}{4}$ in., very thick. *Panicle* with a stout peduncle and spreading branches. *Flowers* numerous, $\frac{1}{6}$ in. diam.

10. **S. coriacea,** *Thwaites Enum.* 76; very robust, leaves 3–7 in. obovate or obovate-oblong thickly coriaceous tip rounded much reticulate beneath base subacute not narrowed into the very short petiole, panicles very robust with spreading branches, drupe large broader than long.

CEYLON; central province, alt. 5–7000 ft., *Thwaites.*

A moderate-sized tree, glabrous throughout; branchlets as thick as the finger. *Leaves* $1\frac{1}{2}$–$3\frac{1}{2}$ in. broad, hardly shining, pale above when dry, brown beneath, nerves 10–12 pairs, slightly arched, not well defined, as is the case with the reticulations beneath; midrib beneath grooved; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. long, and broad. *Panicles* fascicled,

rachis very stout. *Flowers* $\frac{1}{3}$ in. diam., sessile, clustered. *Nut* $1\frac{1}{2}$ in. diam., obliquely cordate, compressed, apiculate; cup short, narrow.

11. **S. subpeltata,** *Thwaites Enum.* 75; leaves peltate 10–15 in. oblong or ovate- or obovate-oblong abruptly obtusely acuminate thickly coriaceous broadly margined shining and reticulate above opaque and minutely closely dotted beneath, panicle terminal stout, nuts transversely oblong.

CEYLON; forests between Galle and Ratnapoora, *Thwaites.*

A large tree, glabrous throughout; branchlets as thick as the finger. *Leaves* 4–$6\frac{1}{2}$ in. broad, very thick, polished above and reticulate on both surfaces, base rounded with the petiole inserted $\frac{1}{3}$ in. within it; nerves 16–20 pairs, nearly horizontal; midrib grooved on both surfaces; petiole $1\frac{1}{2}$–2 in., very stout indeed. *Panicle* small for the size of the plant, branches spreading. *Flowers* $\frac{1}{6}$ in. diam. *Nut* $1\frac{1}{4}$ in. broad, much shorter; cup large, kidney-shaped, fleshy.—A very handsome plant.

12. **S. Gardneri,** *Thwaites Enum.* 76 & 410; leaves 6–15 in. lanceolate or elliptic or linear-lanceolate obtusely acuminate strongly closely reticulate and dark beneath, midrib broad above, petiole 1–2 in., panicles axillary and terminal, nuts $\frac{2}{3}$ in. obliquely oblong broader than long.

CEYLON, common in the central province, ascending to 3000 ft.

A moderate-sized tree, glabrous throughout; branchlets not very stout. *Leaves* usually narrowly elliptic-lanceolate, coriaceous, opaque above, dark and densely reticulate beneath; base not decurrent on the petiole; margin cartilaginous, waved; midrib very broad and flat; nerves 10–15 pairs, nearly horizontal or arched and ascending; ultimate venules curved with free ends, pale on a dark green ground. *Panicles* numerous, axillary and terminal. *Nuts* oblique, broader than long; cup shallow.—The minute reticulation of the undersurface of the leaf of this species is quite peculiar. Thwaites' original 1257 (of first distribution) has leaves of the following species and fruit of this. Marchand (Rev. Anacard. 169) refers this to *S. Anacardium* var. *angustifolium DC.* (Prodr. ii. 62), an Amboyna plant, I know not on what authority.

13. **S. Walkeri,** *Hook. f.*; leaves 4–7 in. elliptic or oblong-lanceolate acuminate transversely strongly reticulate and pale beneath, midrib slender above, petiole 1–2 in., panicles terminal axillary and on the old wood, nut ovoid-oblong erect half sunk in the cup.—S. obscura, *Thwaites Enum.* 410.

CEYLON; *Walker, Thwaites* (C. P. 2940).

This, which was first sent out by Thwaites with *S. Gardneri,* and afterwards referred by him to *S. obscura,* differs from the latter in the leaves not being decurrent and the long petioles, and from the former in the very different reticulation of the pale undersurface of the leaf, as well as in the form of the nut.

14. **S. obscura,** *Thwaites Enum.* 76; leaves 3–6 in. obovate-oblong narrowed into the very short petiole tip obtuse or rounded pale and strongly reticulate beneath, midrib slender above, panicles terminal, nut ovoid-oblong. ? S. zeylanica, *Blume Mus. Bot.* i. 189. S. oblongifolia, var. *Thwaites, C.P.* 1258; *Marchand Rev. Anacard.* 169, var. 3.

CEYLON; in the central province alt. 3000 ft., *Macrae, Thwaites, Gardner.*

A moderate-sized tree, glabrous throughout. *Leaves* $1\frac{1}{2}$–2 in. broad, gradually decurrent on the petiole, undersurface and its reticulations like those of *S. Walkeri*; petiole $\frac{1}{8}$ in. *Nut* $\frac{3}{4}$ in., half sunk in the cup.

15. **S. acuminata,** *Thwaites Enum.* 76; leaves 4–12 in. elliptic- ovate- or oblong-lanceolate finely caudate-acuminate closely reticulate and dark beneath, petiole $\frac{3}{4}$ in., panicles terminal and axillary, nut 1 in. obcordate broader than long. S. oblongifolia, *Thwaites Enum. l.c.* S. oblongifolia, var. 2, *Marchand Rev. Anacard.* 169.

CEYLON; forests in the Galle, Ratnapoora and Ambagamowa districts, *Thwaites.*

I retain this species with great hesitation, having only a flowery specimen, and finding it referred to a variety of *S. oblongifolia*, by Thwaites, in his Addenda. From the latter it appears to me to be wholly distinct, having precisely the peculiar reticulation and undersurface colouring of *S. Gardneri*, from which it differs in the long acute tail to the apex of the leaf and slender midrib above. According to Thwaites's description, it further differs in the less coriaceous leaves, smaller panicle, and differently shaped fruit. From *S. nigro-viridis* and *S. obscura* it seems to me to differ in the leaf not being decurrent into the petiole, and in its very long acute tip.

16. **S. nigro-viridis,** *Thwaites Enum.* 76 & 410 (excl. var. acuminata); leaves 3–6 in. obovate-cuneate or oblong-obovate narrowed into the petiole, tip rounded or abruptly obtusely acuminate, pale and reticulate beneath, midrib above slender, panicles terminal short, nut broader than long. S. oblongifolia, var. nigro-viridis, *Thwaites* (C.P. 631, 641, 2444, 2586); *Marchand Rev. Anacard.* 169.

CEYLON, central province, alt. 2–4000 ft., *Thwaites.*

A moderate-sized tree, glabrous throughout. *Leaves* $1\frac{1}{4}$–2 in. broad, very variable in breadth, but almost always cuneate-obovate and decurrent on the petiole, which is $\frac{1}{2}$–1 in., very dark green; nerves 6–10 pairs, much arched, reticulate as *S. obscura* and *S. Walkeri*. *Panicles* short, reduced to racemes. *Flowers* large, $\frac{1}{3}$ in. diam. *Nut* described by Thwaites as obliquely rounded or obcordate, compressed, with a hooked apiculus, and narrower cup; and this they are in his No. 2586, but in one specimen of 631 they are ovoid and erect, and quite 1 in. long. Thwaites's 631 *bis*, with ♂ flowers only, also sent as *S. nigro-viridis*, has elliptic-lanceolate leaves finely acuminate and not narrowed into the petiole, which is longer, with very large spreading panicles. It is probably identical with his original 1257, mentioned under *S. Gardneri.*

17. **S. parvifolia,** *Thwaites Enum.* 77; leaves $1\frac{1}{2}$–$3\frac{1}{2}$ in. obovate or elliptic decurrent on the slender petiole tip rounded or obtusely abruptly acuminate, margin cartilaginous, strongly closely reticulate beneath with thick nervules, racemes terminal slender few-flowered, flowers pedicelled. S. oblongifolia var. 4, *Marchand Rev. Anacard.* 169.

CEYLON; Galle district, at Hinidoon Corle, *Thwaites.*

A moderate-sized tree, glabrous throughout. *Leaves* the smallest of the genus, $\frac{3}{4}$–$1\frac{1}{4}$ in. broad, very thickly coriaceous, and with a remarkably strong cartilaginous border, shining above with a slender midrib, undersurface pale; nerves 7–12 pairs, nearly horizontal; petiole $\frac{1}{2}$ in., much more slender than usual in the genus. *Racemes* shorter than the leaves. *Nut* unripe, elongate-conic with a curved acuminate tip and a turbinate narrow cup.

18. ? **S. lurida,** *Hook. f.*; leaves 5–8 in. narrowly elliptic-oblong or -lanceolate obtuse very coriaceous decurrent on the petiole opaque and reticulated beneath with many spreading nerves, midrib above broad, panicles terminal black when dry shorter than the leaves, flowers minute pedicelled.

MALACCA, *Maingay.*

A tree, quite glabrous throughout. *Leaves* $1\frac{1}{2}$–$2\frac{1}{4}$ in. broad, almost shining above, very opaque and lurid (as if glaucous when fresh) beneath, usually suddenly contracted into an obtuse tip; nerves 30–40 pairs, very slender, but not much raised beneath; midrib convex and much broader above; petiole $\frac{3}{4}$–1 in., stout. *Panicles* terminal and axillary, much branched, the lateral branches $\frac{1}{2}$–1 in. long, bearing loose cymes of ♂ flowers not $\frac{1}{20}$ in. diam. *Calyx* obtusely 5-lobed. *Petals* broadly oblong, obtuse. *Stamens* 5, anthers subglobose. *Disk* broad, fleshy, margin lobed. *Ovary* imperfect. —I am very doubtful of the genus of this plant, of which I have seen no fruit.

*** Leaves glabrous on both surfaces. Panicles pubescent.

19. **S. subpanduriformis,** *Wall. Cat.* 987; leaves lanceolately panduriform acuminate membranous white beneath, petiole short slender, panicle terminal much branched.

CHITTAGONG, *Wallich* (cult. in Calcutta Bot. Gardens).

Branchlets stout. *Leaves* 1 ft. and upwards by $3\frac{1}{2}$–4 in., broadest much above the middle, thence rapidly narrowing upwards to a very acuminate point and downwards to the petiole but dilating again for one-fourth above the base, exceedingly thin and membranous, opaque above, beneath brownish white, with faint indications of pubescence on the nerves and midrib, reticulations very delicate; nerves 16–30, very slender, straight; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. *Panicles* as long as the leaves, very robust and much branched, finely pubescent. *Flowers* unknown. *Fruit* immature, obliquely orbicular, compressed, with a small cup.

20. **S. heterophylla,** *Blume Mus. Bot.* i. 187; leaves 6–14 in. oblong or obovate-oblong thickly coriaceous tip abruptly obtusely acuminate shining above pale and reticulated beneath, petiole $\frac{1}{2}$–1 in., panicle pubescent very large with slender erecto-patent branches, flowers minute. *Miq. Fl. Ind. Bat.* i. pt. 2, 625.

TENASSERIM or ANDAMAN ISLANDS, *Helfer.*—DISTRIB. Sumatra, Java.

Perfectly glabrous except the panicle. *Leaves* very variable according to Javanese specimens, 1–4 in. broad, thick, hard, and leathery, reticulated on both surfaces, whitish beneath, margin thickened, cartilaginous, base acute but not decurrent on the petiole; nerves 12–15 pairs, shining, somewhat arched. *Panicle* of the ♂ very large, a foot long and more, and as broad; branches strict, pale, the ultimate slender with small clusters of minute sessile flowers. *Nut* in Java specimens transversely oblong, 1 in. diam.; cup much narrower, shallow, pubescent when young.

SPECIES UNKNOWN OR IMPERFECTLY KNOWN TO ME.

S. SUBRACEMOSA, *Kurz in Jour. As. Soc. Beng.* 1872, ii. 304; young parts puberulous, leaves deciduous? distant 3–4 in. oblong or oblong-lanceolate obtuse or subobtuse subdecurrent into a broad glabrous petiole $\frac{1}{2}$–1 in. thinly chartaceous glaucous glabrous and shining above, glaucous beneath and minutely puberulous when young, midrib thick, nerves parallel, reticulations lax and conspicuous, panicles axillary and terminal graceful puberulous, flowers small in fascicled cymes, pedicels very short densely pubescent, calyx puberulous, petals valvate, filaments capillary, disk hispid, styles 3 thick.—Pegu, *Kurz.* Probably a *Holigarna.*

S. ACUMINATA, *Kurz in Jour. As. Soc. Beng.* 1870, ii. 75; perfectly glabrous, leaves 6–12 in. cuneate-obovate or -oblong acuminate, base narrowed acute or acuminate glaucous beneath, nerves slender acutely prominent, reticulations lax conspicuous, panicles terminal slender shorter than the leaves, lax quite glabrous, calyx-teeth broad acute, petals oblong-lanceolate acuminate, disk hispid, ovary glabrous, drupe obliquely oblong broader than long, cup as broad, scarlet.—Frequent in the forests of Arracan on sandstone; also in Chittagong, *Kurz.*

S. LÆVIGATA, *Thwaites in Herb.* (Coll. 3948); a small species in a very imperfect state, with glabrous elliptic-obovate obtusely acuminate leaves 2–4 in. long shining above transversely strongly reticulated beneath,—South parts of Ceylon. S. oblongifolia var. 5, *Marchand Rev. Anacard.* 109.

S. ALBESCENS, *Kurz in Beng. As. Soc. Jour.* 1871, ii. 51; 'a large tree, young parts velvety-tomentose, leaves 7–12 in. elongate-obovate or cuneate-lanceolate shortly and obtusely acuminate, base cuneate rounded or obtuse shining and glabrous above except the pubescent nerves, thinly clothed with white tomentum and sparingly hairy beneath, nerves yellow conspicuous yellowish pilose not tomentose, reticulations

lax, petiole ½–1 in. thick tomentose, panicle densely yellow tomentose usually shorter than the leaves, flowers small racemulose, pedicels $\frac{1}{12}$–$\frac{1}{6}$ in., calyx minute pubescent, petals valvate or subvalvate $\frac{1}{12}$ in. shortly pubescent, ovary densely appressedly hirsute, stigmas 3 thick glabrous, disk glabrous, stamens 5, filaments short rather broad 1 or 2 longer and abortive.'—*Kurz.*

PEGU; in the Moung forest. *Brandis.*

15. **DRIMYCARPUS,** Hook. f.

Lofty trees. *Leaves* alternate, petioled, simple, quite entire. *Racemes* or panicles axillary. *Flowers* small, subglobose, polygamous. *Calyx* superior; lobes 5, rounded, imbricate. *Petals* 5, erect, orbicular, imbricate. *Disk* broad, annular. *Stamens* 5, inserted at the base of the disk. *Ovary* inferior, 1-celled; style 1, very short; stigma capitate; ovule attached to the wall of the cell. *Drupe* transversely obliquely ovoid, fibrous, flesh resinous; stone coriaceous. *Seed* attached to the wall of the cell, testa membranous; embryo thick, cotyledons plano-convex radicle minute opposite the hilum; plumule hairy.—DISTRIB. 2 or 3 Indian species.

1. **D. racemosus,** *Hook. f. in Benth. & Hook. f. Gen. Pl.* i. 424; leaves linear-oblong or lanceolate acuminate glaucous beneath, margins waved. Holigarna racemosa, *Roxb. Fl. Ind.* ii. 82; *Wall. Cat.* 1006.

SIKKIM and BHOTAN HIMALAYA, alt. 2–5000 ft.; SILHET and KHASIA MTS., alt. 0–4000 ft.

A large tree; branchlets glabrous. *Leaves* 4–12 in., coriaceous, shining above, opaque and grey beneath; nerves 20–30 pairs, strongly arched; reticulations delicate; midrib above rather broad; petiole ½ in., stout. *Racemes* branched in axillary fascicles, shorter than the leaves, pubescent or glabrate. *Flowers* $\frac{1}{10}$ in. diam., crowded, the males most so, greenish-white. *Drupe* red, 1 in. diam.—Marchand (Rev. Anacard. 172) mentions a *Holigarna angustifolia* Roxb. as identical with this, but I find no such name published by Roxburgh.

16. **HOLIGARNA,** Ham.

Lofty trees. *Leaves* alternate, simple, petioled, entire, coriaceous; petiole furnished with 2 or 4 spur-like decidous appendages. *Racemes* or *panicles* axillary and terminal. *Flowers* small, crowded, polygamous. *Calyx* superior; tube cup-shaped; teeth 5, imbricate. *Petals* 5, densely villous in front, cohering with the edge of the disk and at the base, persistent, valvate. *Disk* lining the calyx-tube, obscure in the ♀. *Stamens* 5, inserted on the edge of the disk, coherent at the base with the petals, filaments subulate, glabrous; anthers small, subglobose. *Ovary* inferior, 1-celled; styles 3–5, terminal, stigmas capitate or clavate; ovule pendulous from near the top of the cell. *Drupe* subcompressed, oblong or ovoid, resinous, acrid; stone coriaceous. *Seed* parietal, testa membranous; embryo thick, cotyledons plano-convex; radicle minute next the hilum.—DISTRIB. 7 species, all Indian.

* *Leaves quite glabrous beneath.*

1. **H. Arnottiana,** *Hook. f.*: leaves cuneate-obovate obtuse or acute quite glabrous decurrent on the petiole, petiole with two tubercles at the top, panicles slender tomentose, drupe glabrous. H. longifolia, *Wt. & Arn. Prodr.* i. 169; *Grah. Cat. Bomb. Pl.* 41; *Dalz. & Gibs. Bomb. Fl.* 51; *Beddome Fl. Sylv.* t. 167 (not of *Roxburgh*). Terebinthacea, *Wall. Cat.* 8504.

WESTERN PENINSULA; from the Concan southwards on the Ghats.

A tree, branches stout. *Leaves* 6–9 by 2–3 in., coriaceous, shining above, reticulated and glaucous or not beneath; nerves 16–20 pairs, strong, nearly straight, prominent on both surfaces; petiole ¼–1 in., rather slender; petiolar spurs early deciduous. *Panicles* of compound racemes, axillary and terminal, shorter or longer than the leaves, thickly rufous-tomentose when dry. *Flowers* crowded, minute, ♂ ⅛ in. diam., enveloped in tomentum. *Drupe* 1 in., obliquely oblong, rounded at the top, quite glabrous, long pedicelled.—Wight's originally distributed specimens (No. 526) have leaves pubescent beneath.

2. **H. ferruginea,** *Marchand Rev. Anarcard.* 171; leaves cuneate-obovate rounded at the tip quite glabrous decurrent on the petiole, petiole with two tubercles at the top, racemes robust clothed with dark rusty tomentum. Terebinthacea, *Wall. Cat.* 8503.

WESTERN PENINSULA: Coorg, *Herb. Stocks*; TRAVANCOR, *Herb. Wall.*; Mangalore, *Wight.*

Very similar to *H. Arnottiana*, but the racemes are short and very robust, less branched and clothed with a deeper red (when dry) tomentum, and the flowers are much larger, being fully ¼–⅓ in. diam. *Stamens* longer than the petals. *Styles* 3–4 in., elongate.—The terminal bud of this species seems more glabrous than in the *H. Arnottiana.*

3. **H. longifolia,** *Roxb. Cor. Pl.* iii. 79, t. 282; *Fl. Ind.* ii. 80; leaves 1–2 ft. very narrowly cuneate-oblanceolate acuminate membranous glabrous and glaucous beneath, petiole very short and thick, petiolar spurs 2 or 4 persistent or deciduous, ♂ panicle finely pubescent. *DC. Prodr.* ii. 63.

CHITTAGONG, *Roxburgh*, &c.; PEGU, *Kurz.*

A tall tree; bark white. *Leaves* thinly coriaceous, hardly shining above, ciliate when quite young, ending in a long acuminate point, gradually narrowed from above the middle to the base which is hardly decurrent on the petiole; nerves 20–25 pairs, erecto-patent, slender, reticulations large; petiole ¼–⅓ in. *Panicle* very large and spreading, ♀ tomentose. *Flowers* $\frac{1}{10}$ in. diam., clustered. *Fruiting panicle* 18 in. long, with spreading decurved branches. *Drupes* (immature) oblong.—Specimens from Kurz.

4. **H. Helferi,** *Hook. f.*; leaves 8–16 in. cuneate-oblanceolate acute or acuminate glaucous beneath rather coriaceous, decurrent on the very short petiole, spurs two on each side slender persistent, ♂ panicle much branched softly densely tomentose, ♀ simple racemose.

TENASSERIM; at Mergui, *Helfer.*

Branchlets stout, as thick as the finger. *Leaves* very variable in size, the smaller 7 by 2 in., with 10–12 pairs of nerves; the large 16 by 4 in., with 26 pairs of nerves; upper surface opaque, under purplish-brown when dry; midrib very prominent, grooved, nerves slightly arched, slender; transverse venules reticulated. *Panicles* ♂ rather slender, clothed with soft lax ferruginous tomentum. *Flowers* $\frac{1}{12}$ in. diam., in small glomerules; ♀ in stout simple racemes, pedicelled, very much larger than the ♂. *Drupe* subcylindric, truncate, ¾ in.—This may prove to be a form of *H. longifolia*, but I do not think so.

** *Leaves pubescent beneath.*

5. **H. Grahamii,** *Hook. f. (not of Kurz)*; leaves 12–16 in. oblanceolate-cuneate triangular above the middle and acuminate finely pubescent beneath, petiole very short and thick, petiolar spurs 2 or 4 persistent. Semecarpus Grahamii, *Wt. Ic. t.* 235; *Ill.* i. 185; *Dalz. & Gibs. Bomb. Fl.* 52.

WESTERN PENINSULA; Concan, *Graham*, &c.

A tree 20–30 ft.; branchlets very robust. *Leaves* 4–6 in. diam., gradually narrowed from above the middle to the base, hardly decurrent on the petiole, very rigidly

coriaceous, shining above, pale and reticulated beneath; nerves 20–30 pairs, very prominent beneath; petiole $\frac{1}{2}$ in., spurs 1 or 2 on each side $\frac{1}{4}$–$\frac{1}{3}$ in. *Panicles* terminal, ♂ a foot long, much branched, clothed with ferruginous tomentum, ♀ shorter. *Flowers* clustered, ♂ about $\frac{1}{8}$ in. diam. *Styles* 3. *Drupe* ovoid, glabrous, $\frac{2}{3}$ in. long, upper $\frac{1}{6}$ or $\frac{1}{4}$ exserted.—Kurz gives this as a native of Pegu, but the plants he sends to Kew under this name are in part the true *H. longifolia* of Roxburgh, and in part *H. albicans*. *H. Grahamii* differs from *H. longifolia* in the leaf being more triangular at the top, not rounded and suddenly acuminate.

6. **H. Beddomei**, *Hook. f.*; leaves 10–22 in. cuneate-oblanceolate sometimes much produced below acute or acuminate densely velvety beneath young membranous and ciliate.

Western Peninsula; Anamallay hills, *Beddome*.

An enormous tree, Beddome. *Leaves* when old 10 in. long, coriaceous, densely velvety, rufous; nerves 18–22 pairs, stout, ferruginous, those of young plants 20 in. long, membranous, ciliate with long hairs on the margin midrib and under surfaces; nerves slender 40–50 pairs, horizontal in the lower very elongated portion, more arching above; petiole short; stipular spurs capillary, caducous.—A very fine species of which the leaves only are known.

7. **H. albicans**, *Hook. f.*; leaves 6–16 in. oblanceolate-cuneate or oblong coriaceous acuminate shining and reticulate above white beneath and glabrous or very minutely pubescent in the midrib only laxly reticulate, panicle pubescent as long as the leaf much branched, branches slender, ♂ flowers shortly pedicelled $\frac{1}{4}$ in. diam., drupe broader than long oblique. H. Grahamii, *Kurz in Journ. As. Soc. Beng.* 1872, ii. 205.

Pegu, Martaban, *Kurz, McLelland, Scott.*

Branchlets as thick as the thumb. *Leaves* 2–4 in. broad, base not decurrent on the petiole, obtuse; midrib stout faintly grooved; nerves 14–18 pairs all raised, arched; petiole $\frac{1}{2}$–$\frac{3}{4}$ in. *Panicle* of ♂ peduncled, rachis curved, branches very slender, spreading; of ♀ also much branched and spreading. *Flowers* ♂ only seen. *Sepals* small. *Petals* obtuse, pubescent. *Filaments* very slender. *Disk* pubescent. *Drupe* pedicelled, $\frac{3}{4}$ in. diam. when dry, turgid, somewhat compressed, very oblique, the exposed portion much smaller, convex, puberulous.—Apparently a very distinct species, of which a large-leaved specimen from Kurz is marked *H. Grahamii*, Kurz (*Semecarpus*, Wight.) I find no trace of spurs on the petiole, but have seen no very young leaves. Kurz describes this as beard-like.

17. **MELANOCHYLA**, Hook. f.

Trees. *Leaves* simple, very coriaceous, exstipulate, quite entire. *Panicles* branched, axillary and terminal. *Flowers* small, unisexual. Calyx-tube persistent, enlarged in fruit and adnate to the very base of the drupe, cupular, lobes 5, erect. Petals 5, inserted on the edge of the disk, very coriaceous, persistent, erect or suberect, villous in front, valvate. *Disk* lining the calyx-tube. *Stamens* inserted on the edge of the disk, filaments stout, sometimes coherent at the base with the petals villous; anthers oblong. *Ovary* globose, 1-celled; style short, stigmas 3; ovule 1, pendulous from near the top of the cell. *Drupe* globose, areolate at the base by the enlarged calyx, flesh full of black varnish; stone thick, hard. *Seed* oblong, testa thin; cotyledons amygdaloid, radicle superior.—Distrib. The following are the only known species.

1. **M. tomentosa**, *Hook. f.*; branchlets petiole panicle and midrib beneath velvety-tomentose, leaves oblong acuminate rounded or subcordate at the base.

MALACCA, *Maingay.*

Branchlets rather stout, densely clothed with soft spreading ferruginous tomentum. *Leaves* 6–14 by 2–4 in., hard, smooth but hardly polished above, with a slender midrib, not reticulated; beneath pale with 30–35 pairs of strong arched pubescent nerves, and faint reticulations; petiole very thick, $\frac{1}{4}$–$\frac{1}{2}$ in. *Panicle* exceeding the leaves, rachis almost villous, branches spreading pubescent. *Flowers* ♂ minute, $\frac{1}{12}$ in. diam., in small lateral cymes, shortly pedicelled. *Calyx* lobed for half way down, lobes obtuse. *Petals* oblong, obtuse, pubescent outside, villous within, very coriaceous. *Filaments* rigid nearly as long as the petals. *Drupe* elliptic, globose, 1–1$\frac{1}{2}$ in. diam., orange-yellow, clothed with ferruginous (when dry) pubescence, and full of black varnish.

2. **M. angustifolia,** *Hook. f.*; leaves linear-lanceolate or -oblanceolate acuminate quite glabrous, petiole long slender, panicles slender puberulous.

MALACCA, *Maingay.*

Branchlets rather slender, minutely puberulous, as are the panicles. *Leaves* 6–10 by 1$\frac{1}{4}$–1$\frac{3}{4}$ in., hard, base acute often unequal, margin rather waved, shining on both surfaces, reticulations not well defined; midrib slender above, strong beneath; nerves 15–20 pairs, arched; petiole 1–1$\frac{1}{2}$ in. very slender, greatly thickened from $\frac{1}{4}$ in. above the base. *Panicles* chiefly axillary, very slender, longer or shorter than the leaves. *Flowers* in lateral cymules, ♂ $\frac{1}{12}$ in. diam.; like those of *M. tomentosa*, but much less tomentose. *Drupe* unripe $\frac{1}{2}$–$\frac{3}{4}$ in. diam, globose, apiculate, puberulous.—Maingay describes the corolla as imbricate, but I find it to be quite valvate.

3. **M. Maingayi,** *Hook. f.*; leaves narrowly elliptic-oblong or -oblanceolate abruptly acuminate pubescent beneath, panicle stout tomentose.

MALACCA, *Maingay.*

A tree yielding a copious black varnish, *Maingay.* Branchlets rather slender, glabrous or pubescent. *Leaves* 5–8 by 2$\frac{1}{4}$–3$\frac{1}{4}$ in., rigidly coriaceous, narrowed into the petiole, smooth but hardly shining above, beneath minutely pubescent; nerves 20–25 pairs, strong, arched; reticulations beneath distinct, transverse; petiole $\frac{1}{2}$–$\frac{3}{4}$ in. *Panicle* terminal, stout, ferruginous. *Flowers* pubescent, ♂ $\frac{1}{8}$ in. diam. subsessile; ♀ more than twice as large, with an almost urceolate calyx. *Filaments* rather broad. *Ovary* globose, hairy. *Fruit* not seen.

4. **M. auriculata,** *Hook. f.*; leaves narrowly linear-oblong from an auricled tapering base recurved acuminate glabrous polished sessile or with a very short enlarged petiole, panicle ♂ stout pubescent.

MALACCA, *Maingay.*

Branchlets very thick and woody. *Leaves* 18 by 3–4 in., rigidly coriaceous, apparently folded down the middle, recurved, polished on both surfaces, base $\frac{1}{2}$–$\frac{3}{4}$ in. broad, auricles recurved; nerves about 30 pairs, slightly arched, more prominent above than beneath, transverse reticulations faint beneath; midrib at the base suddenly expanding into a petiole $\frac{1}{4}$ in. long and as broad, which is adnate to the branch. *Panicles* terminal, smaller than the leaves, rusty-pubescent, rachis very stout. *Flowers* ♂ clustered about $\frac{1}{8}$ in. diam. *Drupe* oblong-globose, 1$\frac{1}{4}$–1$\frac{1}{2}$ in. diam., puberulous, ribbed when dry; stone very thick.

18. **NOTHOPEGIA,** Blume.

Small tree. *Leaves* alternate or opposite, petioled, entire. *Racemes* short axillary. *Flowers* small, bracteate, white, polygamous. *Calyx* small, 4–5-lobed, persistent. *Petals* 4–5, spreading, imbricate. *Disk* annular, 4–5-lobed. *Stamens* 4–5, inserted on the margin of the disk, filaments free hairy. *Ovary* free, sessile, ovoid, 1-celled; style very short, stigma simple; ovule pendulous

from near the top of the cell. *Drupe* depressed-turbinate, striate, tipped with the style, flesh cellular. *Seed* pendulous; cotyledons thick, plano-convex, radicle short sublateral.—DISTRIB. The following are the only species.

1. **N. Colebrookiana,** *Blume Mus. Bot.* i. 203; branchlets glabrous, leaves elliptic-lanceolate acuminate quite glabrous, margin usually waved. *Bedd. Flor. Sylv.* t. 164; *Anal. Gen.* 79. Pegia? Colebrookiana, *Wt. Ic.* t. 236; *Ill.* i. 185. Glycycarpus racemosus, *Dalz. in Hook. Kew Journ. Bot.* ii. 39; *Hook. Ic. Pl.* t. 842; *Dalz. & Gibs. Bomb. Fl.* 51, *excl. syn.*; *Thwaites Enum.* 78.

WESTERN PENINSULA; on the Ghats from the Southern Concan southwards. CEYLON; ascending to 3000 ft. Common.

A small tree, about 15 ft. high, with milky acrid juice. *Leaves* 2–8 by 1–2½ in., usually elliptic-oblong with a tendency to be more narrow below than above, rarely narrower and 8 by 1½ in., base decurrent on the petiole, shining above, usually white beneath; nerves 15–20 pair, not prominent beneath, arched, reticulations also not sharply defined; petiole ½–¾ in. *Racemes* much shorter than the leaves, solitary and fascicled, strict; ♂ branched, much longer and more branched than the ♀, more or less pubescent. *Flowers* minute; ♂ sessile or nearly so, $\frac{1}{10}$ in. diam. *Petals* suberect with recurved tips, hairy on the back. *Sepals* almost orbicular. *Filaments* almost glabrous. *Drupe* ¼ in. diam., red, top depressed.

VAR. 1. *Heyneana*; leaves smaller 2–3 in. more shortly petioled obtuse, drupe blue. —Terebinthacea? *Wall. Cat.* 8500.

VAR. 2. *macrocarpa*; leaves 3–4 in. obovate-oblong shortly obtusely acuminate very coriaceous, drupe ½–¾ in. diam., top not depressed.—Shevaghery hills, *Wight.*

2. **N. travancorica,** *Beddome MSS.*; branchlets petiole and midrib beneath pubescent with short spreading hairs, leaves elliptic-lanceolate acuminate, petals hairy within.

WESTERN PENINSULA; Travancor, *Beddome.*

Leaves 6–7 by 1¼–1¾ in., almost membranous, margin thickened, green below, ciliate towards the base which is acute and not decurrent on the petiole; nerves 30–35 pairs, slightly arched; petiole ½ in. *Flowers* ♀ in supra-axillary glomerules, ⅛ in. diam. *Petals* ovate-lanceolate. *Filaments* hairy, broad.—I have seen only imperfect specimens.

3. **N. aureo-fulva,** *Beddome MSS.*; branchlets petiole and midrib beneath densely rufous villous, leaves opposite narrow linear.

WESTERN PENINSULA; Tinnevelly, *Beddome.*

Leaves 7–8 by 1 in., obtuse or acute, rather membranous, shining above, much reticulated beneath; nerves about 30 pair, slender, arched; petiole ⅓ in.—I have seen only an imperfect specimen of this very curious species.

19. CAMPNOSPERMA, Thwaites.

Trees. *Leaves* alternate, very coriaceous, simple, quite entire. *Racemes* axillary, simple or sparingly branched. *Flowers* sessile, minute, hermaphrodite. *Calyx* 3–5-partite; segments erect, persistent, imbricate. *Petals* 3–6, suborbicular, erect, imbricate. *Disk* urceolar. *Stamens* 6–10; inserted at the base of the disk. *Ovary* free, sessile, ovoid, 1-celled (or 2-celled with 1 cell suppressed); style very short, stigma discoid or capitate; ovule 1, pendulous from the top of the cell. *Drupe* ovoid, fleshy; stone hard, almost 2-celled by a vertical plate from the top of the horse-shoe shaped cell. *Seed* pendulous, curved round the

imperfect septum; cotyledons curved, flattish; radicle short superior.—A genus of 6 species, of which one is a native of Madagascar, and another of the Seychelles.

1. **C. zeylanicum,** *Thwaites in Hook. Kew Journ. Bot.* vi. 65, *t.* i. A; *Enum.* 78; leaves glabrous above dotted beneath finely reticulate, racemes short stout glabrous.

CEYLON; Saffragan and Ambamagowa districts, generally on river banks. *Thwaites.*

A ramous tree, 30–40 ft.; branchlets stout, terete, youngest parts minutely scaly. *Leaves* 3–7 by 2–2½ in., elliptic-obovate or oblanceolate or obovate, obtuse, base decurrent on the petiole, thickly coriaceous, smooth and beautifully reticulated on both surfaces, the numerous spreading nerves hardly more distinct than the reticulations, pale brown when dry, covered beneath with minute dot-like scales; midrib prominent beneath; petiole stout ½–¾ in. *Raceme* usually shorter than the leaves, rachis stout. *Flowers* $\frac{1}{12}$ in. diam. *Drupe* nearly globose, ⅓–½ in. diam. purple.

2. **C. macrophylla,** *Hook. f.;* leaves obovate-oblong or obcuneate tip rounded puberulous beneath, reticulations obscure, nerves close-set 20–35 pairs, racemes furfuraceously-pubescent. Buchanania macrophylla, *Blume Mus. Bot.* i. 185; *Miq. Fl. Ind. Bat.* i. pt. 2, 637.

MALACCA, *Griffith.* SINGAPORE; Schomburgk, &c.—DISTRIB. Sumatra, Borneo.

A small tree; branchlets pubescent, as thick as the finger. *Leaves* full grown, 8–14 by 3½–6½ in., thickly coriaceous, shining above, and scarcely reticulate beneath, clothed with a very fine rusty down; nerves nearly straight, strong, transverse, venules obscure; petiole 1–3 in., very stout, winged, channelled above, pubescent all over. *Panicles* slender, very variable in length, sometimes 1 ft., lateral branches short or long. *Flowers* very minute, in clusters along the rachis and branches, globose, $\frac{1}{20}$ in. diam., tetramerous. *Sepals* rounded, pubescent. *Petals* orbicular-ovate, obtuse, erect. *Filaments* shortly subulate. *Drupe* ½–¾ in., subacute, compressed, nearly orbicular; stone crustaceous, 3–4-celled.

3. **C. Griffithii,** *Marchand Rev. Anacard.* 174; leaves obovate-oblong or obcuneate, tip rounded perfectly glabrous reticulate on both surfaces, nerves 14–18 pairs, racemes furfuraceously pubescent. Semecarpus? grandifolia, *Wall. Cat.* 985.

MALACCA, *Griffith, Maingay*; PENANG, *Porter.*

A tall shrubby tree, *Wallich.* Very similar in foliage to *C. macrophylla*, but the leaves are less thick, perfectly glabrous and reticulate on both surfaces, the nerves fewer and more distant, the petioles longer (2–3 in.) and winged to the base, and the panicles are more slender.—Griffith (MSS.) describes the flowers as 5-merous, but I find them to be 4-merous.

4. **C. auriculata,** *Hook. f.;* leaves obovate-spathulate auricled at the very base tip rounded quite glabrous reticulated on both surfaces, nerves 12–18 pair, panicles pubescent very slender. Buchanania auriculata, *Blume Mus. Bot.* i. 185; *Miq. Fl. Ind. Bat.* i. pt. 2, 637.

SINGAPORE, *Maingay, T. Anderson.*—DISTRIB. Sumatra, Borneo.

Leaves of the same character as those of *C. Griffithii* but smaller, 6–9 by 2–3 in., coriaceous, very gradually narrowed downwards into the petiole, which is ½–1 in., the auricles quite small, beautifully reticulate on both surfaces, as in *C. zeylanica*, nerves arched, very slender. *Panicle* as in *P. grandifolia*, but less pubescent. *Flowers* similar, 4-merous.

20. SPONDIAS, Linn.

Deciduous glabrous trees. *Leaves* usually crowded at the tips of the branches, alternate, odd-pinnate; leaflets sub-opposite, usually caudate-acuminate. *Panicles* terminal, spreading. *Flowers* small, polygamous. *Calyx* small, 4–5-fid, deciduous, lobes slightly imbricate. *Petals* 4–5, spreading, subvalvate. *Disk* cupular, broad, crenate. *Stamens* 8–10, inserted beneath the disk. *Ovary* sessile, free, 4–5-celled; styles 4–5, conniving; ovules solitary, pendulous in the cells. *Drupe* fleshy; stone hard, thick, 1–5-celled, the cells erect or diverging and opening by canals through the top of the stone. *Seeds* pendulous, testa membranous; embryo straight, cotyledons elongate plano-convex, radicle short superior.—DISTRIB. About 8 species all tropical.

SPONDIAS DULCIS, *Willd.; Roxb. Fl. Ind.* ii. 452; *Wall. Cat.* 8477 A.; with crenate longer leaflets, is a South-Sea Island plant. introduced into India, and called 'Hog-plum' and 'Otaheite Apple.'—*Wall. Cat.* 8477 B. from the Calcutta gardens is in part *S. lutea*, L., the Hog-plum of the West Indies.

SPONDIAS?; *Wall. Cat.* 8479, from Hurdwar appears to be *Rhus succedanea*, Linn.

1. **S. mangifera,** *Willd.; DC. Prodr.* ii. 75; leaflets 4–6 pairs 2–9 in. oblong acuminate quite entire, panicle 1–2 ft., drupe ovoid, stone rough and fibrous. *Roxb. Fl. Ind.* ii. 451; *W. & A. Prodr.* 173; *Wt. Ill.* i. 186, t. 76; *Wall. Cat.* 8476; *Bedd. Fl. Sylv.* t. 169; *Dalz. & Gibs. Bomb. Flor. Suppl.* 19; *Grah. Cat. Bomb. Pl.* 42; *Brand. For. Flor.* 128. S. amara, *Lamk.*; *Ham. in Trans. Linn. Soc.* xiii. 531. Evia amara, *Comm.; Blume Mus. Bot.* i. 234; *Thwaites Enum.* 78. Mangifera pinnata, *Kœn.* (*not Lamk.*).—*Rheede Hort. Mal.* i. t. 50.

Throughout India from the INDUS eastwards and southwards to MALACCA and CEYLON, ascending to 5000 ft. in the HIMALAYA. Wild and cultivated.—DISTRIB. Tropical Asia.

A small tree, everywhere glabrous. *Leaves* 1–1½ ft.; petiole slender; leaflets 2–9 by 1–4 in., shortly petiolulate, shining, more or less oblique; nerves 10–30 on each side, horizontal, joined by a strong intra-marginal one. *Panicles* large, spreading, sparingly branched. *Flowers* ¼ in. diam., scattered, uni- or bisexual. *Calyx* 5-toothed. *Petals* oblong, greenish-white. *Disk* broad, 10-toothed. *Filaments* short, subulate. *Drupe* 1½–2 in. long, yellow, smooth; flesh very austere; stone cavernous, usually with 1 (1–3) perfect seed.—The 'Amra' of the Hindoos, and the Hog-plum of many Europeans.

2. **S. acuminata,** *Roxb. Fl. Ind.* ii. 453; leaflets 5–8 pair 1½–3 in. elliptic caudate-acuminate quite entire or obscurely crenulate, panicle 6–8 in., drupe ovoid-globose, stone smooth fibrous. *Grah. Cat. Bomb. Pl.* 42; *W. & A. Prodr.* 173; *Wall. Cat.* 8478.

WESTERN PENINSULA; Malabar, *Heyne, Roxburgh*; in the Concan hills, near Kennery caves, *Graham*; Canara, *Ritchie.*

An elegant middling sized tree (Roxb.), apparently differing from *S. mangifera* chiefly in the smaller leaves with longer points, the very short panicle, and smooth stone (if I am right in referring a fruiting plant in Wight's Herbarium to this species).—In Wallich's Herbarium, specimens of *Odina Wodier* are mixed with this.

3. **S. axillaris,** *Roxb. Fl. Ind.* ii. 453; leaflets 6–8-pairs ovate-lanceolate acuminate serrate, drupe ovoid-oblong, stone smooth.

NIPAL, *Roxburgh.*

A small Melia-looking tree. *Leaves* 1 ft.; petiole slender; leaflets shortly petio-

lulate, 3–4 in., pale beneath, not abruptly acuminate as in *S. mangifera* and *acuminata*; nerves free, arching. *Flowers* solitary or subsolitary on the branches, long pedicelled, ¼ in. diam., white. *Calyx* lobes acute. *Petals* elliptic, subacute. *Filaments* short, subulate. *Disk* annular, 10-lobed. *Ovary* 5-celled with 5 short erect styles. *Drupe* 1⅛ in. long, rounded at the top, yellow. *Stone* 5-celled, quite small.—I know this plant only through Roxburgh's description and excellent drawing, which represents a true *Spondias* in the structure of flower, fruit and embryo; but the arched-nerved leaves which he describes as 'gash-serrate' but figures as obtusely serrate), and the subsolitary flowers on the branches with peduncles ¾ in. long, are quite unlike any *Spondias* I know.

4. **S. ? macrophylla,** *Wall. Cat.* 8480; leaflets 3–4-pair 6–9 in. elliptic acuminate.

Birma, at Taong-dong, *Wallich.*

This, of which there are only mutilated leaves and fragments of a panicle without flower or fruit, in Wallich's Herbarium, may be only *S. mangifera.*

21. DRACONTOMELUM, Blume.

Trees. *Leaves* alternate, odd-pinnate; leaflets opposite or alternate, quite entire. *Panicles* axillary and subterminal. *Flowers* small, pale, hermaphrodite. *Calyx* 5-partite, segments conniving, imbricate. *Petals* 5, suberect, subvalvate. *Disk* cup-shaped, crenulate. *Stamens* 10, inserted at the base of the disk. *Ovary* sessile, 5-celled; styles 5, thick, erect (like ovaries), connate by their obtuse, stigmatiferous tips; ovules solitary and pendulous in the cells. *Drupe* globose, fleshy, tubercled above the middle by the style-bases; stone hard, depressed, 2-5-celled; cells diverging, opening by canals through the top of the stone. *Seeds* compressed, pendulous, testa membranous; cotyledons plano-convex, radicle short superior centrifugal.—Distrib. 5 species natives of tropical Asia and the Pacific.

1. **D. mangiferum,** *Blume Mus. Bot.* i. 231, t. 42; leaflets 5–8 pairs opposite and alternate oblong-lanceolate acuminate, panicle much branched pubescent or tomentose. Poupartia mangifera, *Blume Bijd.* 1160 (*excl. synon.*). P. pinnata *Blanco Flor. Filipp.* 393.

Eastern Peninsula, South Andaman Islands, *Kurz*; Malacca, *Griffith, Maingay*; Penang, *Maingay.*—Distrib. Eastward to the Philippines and Fiji Islands, native and cultivated.

A large tree. *Leaves* 1–1½ ft.; petiole cylindric, glabrous or pubescent; leaflets petiolulate, 5–7 by 1½–2½ in., usually rather falcate and oblique at the rounded or cordate base, gradually narrowed to the subacute apex, glabrous above, beneath glabrous puberulous or with tufts of hair in the nerve axils; nerves 10–12 pair, arched, reticulations close small; petiolule ⅛ in. *Panicle* equalling or exceeding the leaves, pubescent or tomentose; pedicels slender, ebracteate. *Flowers* campanulate, ¼–⅓ in. diam., greenish white. *Sepals* pubescent or tomentose. *Petals* longer, recurved. *Filaments* slender. *Drupe* 1 in. diam., depressed.—A variable plant in pubescence, of which I think *D. sylvestre*, Blume, and *D. puberulum*, Miq. are varieties.

Var. 1. Leaflets nearly glabrous beneath with occasional tufts of hair in the nerve axils.—Andaman and Malacca.

Var. 2. Leaflets and petiole pubescent beneath.—Malacca.

Var. 3. Leaflets glabrous beneath, panicles and flowers rusty-tomentose.—Penang.

DOUBTFUL GENUS.

22. RUMPHIA, Linn.

A very large tree. *Leaves* alternate, petioled, simple, broadly ovate-cordate, toothed, rough, aromatic. *Racemes* axillary. *Flowers* bitter. *Calyx* tubular, 3-fid. *Petals* 3, oblong. *Stamens* 3, exserted. *Ovary* subtrigonous; style simple. *Drupe* coriaceous, turbinate, 3-grooved; stone 3-celled, 3-seeded.

1. **R. tiliæfolia,** *Lamk. Dict.* vi. 352; *Ill.* t. 25; *DC. Prodr.* ii. 90. R. amboinensis, *Linn. Sp. Pl.* 49.—*Rheede Hort. Mal.* iv. t. 11.

MALABAR; stony sandy mountain woods in Parakaroo and elsewhere, *Rheede.*

A very large tree; bark red within, aromatic. *Leaves* 4–5 by 2½–3½ in., aromatic, 5-nerved at the base; petiole 1–1½ in. *Racemes* axillary and terminal, shorter than the leaves, woolly. *Flowers* ½ in. diam., inodorous. *Drupe* 1 in. long, obovoid obtusely 3-lobed, rough and setose, flesh bitter; stone triquetrous, 3-celled.

Of this remarkable plant nothing is known except from the plate and description of Rheede. I follow the majority of authors in placing it at the end of *Terebinthaceæ,* with which, however, I suspect it has nothing to do. Jussieu (Gen. Pl. 370) suggests that it may be more allied to *Sapindaceæ.* To me it looks more like a Euphorbiaceous or Verbenaceous plant.

Wallich's TEREBINTHACEA? No. 8501, ex Herb. Wight, is a mixture of *Garuga pinnata* fruits with the leaves and immature fruit of another plant that I do not recognise and which is in a most imperfect state.

ORDER XLVII.—CORIARIEÆ. (By J. D. Hooker.)

Usually glabrous shrubs, with 4-angled sarmentose branches, the lower opposite; buds scaly. *Leaves* opposite, rarely 3-nately whorled, quite entire, sessile, exstipulate. *Racemes* axillary. *Flowers* small, green, hermaphrodite or polygamous. *Sepals* 5, spreading, imbricate, persistent. *Petals* smaller than the sepals, fleshy, keeled within, thickened after flowering and embracing the fruit. *Stamens* 10, hypogynous, free or the alternate adnate to the petals, filaments short; anthers large, oblong, rough. *Disk* 0. *Carpels* 5–10, free, 1-celled, whorled on a fleshy receptacle; styles slender, subulate, fleshy, papillose all over; ovules 1 in each cell, pendulous from the top. *Fruit* of 5 or 10 oblong compressed dry little nuts, closely embraced by the fleshy petals, 1-celled, 1-seeded. *Seed* compressed, testa membranous, albumen a thin layer; cotyledons plano-convex, radicle superior.—DISTRIB. 3–5 species natives of S. Europe, N. Africa, Japan, the Himalaya, New Zealand, and the Andes.

An order of doubtful affinity, perhaps nearest *Phytolaccœ,* which should in this work have been placed in *Thalamifloræ.*

CORIARIA, Linn.

Character of the order.

1. **C. nepalensis,** *Wall. Pl. As. Rar.* iii. t. 289; *Cat.* 6817; leaves ovate or elliptic 3–7 nerved, stamens 10, carpels 5. *Brandis For. Flor.* 128.

TEMPERATE and SUBTROPICAL HIMALAYA, from Marri alt. 3–6000 to Bhotan; ascending to 11,000 ft. in Sikkim.—DISTRIB. Yunan.

A shrub with arched branches, glabrous or puberulous on the leaves beneath and racemes. *Leaves* 1–2 by ¾–1½ in., usually broadly rounded-cordate and abruptly acu-

minate, rarely ovate-oblong or elliptic and acute or acuminate, minutely serrulate. *Racemes* axillary or in the forks, solitary or clustered, 2–6 in. long, rachis glabrous or pubescent; bracteoles oblong, concave, deciduous. *Flowers* about ½ in. diam. *Fruit* ¼–⅓ in. diam., black.

ORDER XLVIII.—**MORINGEÆ.** (By J. D. Hooker.)

Deciduous trees with soft wood. *Leaves* alternate, odd-pinnate or 2–3-pinnate; leaflets opposite, quite entire, caducous as well as the pinnules, glandular at the base. *Panicles* axillary. *Flowers* irregular, bisexual. *Calyx* cup-shaped, 5-cleft; segments unequal, petaloid, deciduous from above the base, imbricate. *Petals* 5, unequal, upper smaller, lateral ascending, anterior larger. *Stamens* inserted on the edge of the disk, declinate, 5 perfect opposite the petals alternating with 5 (or 7) which are reduced to antherless filaments; anthers dorsifixed, 1-celled. *Disk* lining the calyx-tube. *Ovary* stipitate, 1-celled; style slender, tubular, stigma perforated; ovules numerous, in 2 series, on 3 parietal placentas. *Capsule* elongate, beaked, 3–6-angled, 1-celled, loculicidally 3-valved, corky and pitted within. *Seeds* many, in pits of the valves, testa corky winged or not, albumen 0; embryo straight, cotyledons plano-convex, radicle very short superior, plumule many-leaved—DISTRIB. 3 species, natives of Western Asia and N. Africa.

A natural order of very doubtful affinity, which has been referred to near *Resedaceæ, Capparideæ, Melianthæ, Violarieæ, Polygaleæ, Leguminosæ, Bignoniaceæ,* and others.

MORINGA, Lamk.

Character of the order.

1. **M. pterygosperma,** *Gærtn.*; *DC. Prodr.* ii. 478; leaflets elliptic ovate or obovate, nerves obscure, flowers white, capsule 9-ribbed, seeds winged. *W. & A. Prodr.* 178; *Wight Ill.* i. 186, t. 77; *Bedd. Flor. Sylvat.* t. 80; *Dalz. & Gibs. Bomb. Fl.* 314; *Grah. Cat. Bomb. Pl.* 43; *Brand. For. Fl.* 129; *Wall. Cat.* 5814. M. oleifera, *Lamk. Encycl.* i. 398. M. zeylanica, *Pers.* M. polygona, *DC. Prodr.* ii. 478. Hyperanthera Moringa, *Vahl.*; *Roxb. Fl. Ind.* ii. 368; *Griff. Notul.* iv. 572, t. 609. H. decandra, *Willd.* Guilandina Moringa, *Linn.* —*Rheede Hort. Mal.* vi. t. 11.

Forests of WESTERN HIMALAYA and OUDH, and cultivated elsewhere throughout India.—DISTRIB. Cultivated in various tropical countries.

A small tree, bark corky, wood soft, root pungent; young parts tomentose. *Leaves* 1–2 ft., usually 3-pinnate; petiole slender, sheathing at the base; pinnæ 4–6 pairs; leaflets 6–9 pairs, ½–¾ in., opposite, pale beneath; petiolules slender; glands linear, hairy. *Panicles* spreading, bracts linear. *Flowers* pedicelled, 1 in. diam., honey-scented. *Sepals* linear-lanceolate, reflexed. *Petals* narrowly spathulate. *Fertile filaments* villous at the base. *Ovary* hairy. *Pod* 9–18 in., pendulous, 9-ribbed. *Seeds* 3-gonous, winged at the angles.—The Horse-radish tree.

2. **M. concanensis,** *Nimmo in Grah. Cat. Bomb. Pl.* 43; leaflets 1–1¼ in. broadly elliptic or orbicular, nerves 4–6 pair distinct. *Dalz. & Gibs. Bomb. Flor.* 311; *Brandis For. Flor.* 130.

RAJPUTANA, on dry hills; SINDH and the CONCAN.

A tree, very similar to *M. pterygosperma,* but the leaves are much larger as are the leaflets, which are often retuse at the tip; the petals are yellowish streaked with pink. *Seeds* ½ in. long, very broadly trigonous with membranous wings. This may possibly be the red-flowered species alluded to by Roxburgh (Fl. Ind. ii. 368) as occurring near Maldah.

ORDER XLIX. **CONNARACEÆ.** (By J. D. Hooker.)

Erect or climbing shrubs or trees. *Leaves* alternate, exstipulate, 1–3-foliolate or odd-pinnate; leaflets quite entire. *Flowers* racemed or panicled, regular or subregular, usually bisexual. *Calyx* 5-lobed or -partite, usually persistent, imbricate or valvate. *Petals* 5, usually narrow, free or slightly cohering, very rarely valvate. *Stamens* perigynous or hypogynous, sometimes declinate, 5 or 10, those opposite the petals often shorter and imperfect; filaments frequently connate at the base. *Disk* 0, or small annular or incomplete. *Carpels* 5, rarely 1–3 or 6–7, globose, hirsute, 1-celled; styles subulate or filiform, stigmas capitellate simple or 2-lobed; ovules 2, collateral, ascending, orthotropous. *Fruit* usually of 1 rarely 2–3 sessile or stalked 1- rarely 2-seeded follicles. *Seed* erect, arillate or not, testa thick sometimes arilliform below the middle, aril various; cotyledons fleshy in the exalbuminous, leafy in the albuminous seeds, radicle superior, rarely ventral.—DISTRIB. 12 genera, all tropical.

The following Wallichian species of this order are to be rejected.

CONNARACEA, Wall. Cat. 8538, B. is an undeterminable apparently Connaraceous plant.

CONNARACEA ? Wall. Cat. 8534, is *Dialium platysepalum*, Baker.

CONNARACEA ? Wall. Cat. 8550, is *Cupania glabrata*, Kurz.

CONNARACEA ? Wall. Cat. 8553, consists of the foliage of a *Willoughbeia* and fruit of a *Connarus*.

TRIBE I. **Connareæ.** *Calyx* imbricate. *Seeds* exalbuminous.

Calyx not clasping the base of the capsule. Seeds exarillate .	1. AGELÆA.
Calyx accrescent, clasping the base of the sessile capsule. Seeds arillate	2. ROUREA.
Calyx slightly accrescent, not clasping the base of the sessile capsule. Seeds exarillate	3. ROUREOPSIS.
Calyx not accrescent, clasping the pedicel of the stipitate capsule. Seeds arillate	4. CONNARUS.

TRIBE II. **Cnestideæ.** *Calyx* valvate. *Seeds* albuminous or exalbuminous.

Calyx 5-partite, exceeding the petals. Carpels 5, sessile. Capsule hispid within. Seeds albuminous	5. CNESTIS.
Calyx 5-partite, revolute. Petals narrow. Carpels 5. Seeds exalbuminous	6. TÆNIOCHLÆNA.
Calyx 5-partite, erect. Petals oblong. Stamens 5, perfect. Carpel 1. Seeds exalbuminous	7. ELLIPANTHUS.

1. **AGELÆA,** Soland.

Erect or scandent shrubs. *Leaves* 3-foliolate. *Panicles* or *racemes* axillary. *Calyx* 5-partite, not accrescent nor embracing the fruit, imbricate or subvalvate. *Petals* lanceolate or ligulate, obtuse, free or connate at the middle. *Stamens* 5 or 10. *Disk* ½-annular or 0. *Carpels* 3–5. *Capsules* 1–2, sessile or shortly stalked, coriaceous, rugose or lamellate. *Seed* erect, exalbuminous; testa arilliform below the middle.—DISTRIB. 9 species, African and Asiatic.

1. **A. vestita,** *Hook. f.;* branches leaves beneath and inflorescence densely tomentose, leaflets elliptic obtusely caudate-acuminate, stamens 5, styles 5 very

slender. Cnestis vestita, *Wall. in Herb. Linn. Soc.* Connaracea, *Wall. Cat.* 8535. Hemiandrina borneensis, *Hook. f. in. Trans. Linn. Soc.* xxiii. 171, t. 28. Troostwyckia singularis, *Miq. Fl. Ind. Bat. Suppl.* 531. (See *Kurz in Journ. As. Soc. Beng.* 1870, pt. ii. 76.)

EASTERN PENINSULA, Sincapore, *Jack;* Penang, *Porter;* Malacca, *Griffith, Maingay.*—DISTRIB. Borneo.

Densely clothed with fulvous hairs. *Leaflets* 3–6 by 1½–2½ in., lateral, subsessile, terminal petiolulate; nerves beneath very stout, strongly reticulate. *Racemes* 1 in., slender, hirsute. *Flowers* ¼ in. diam. *Capsule* ⅔ in. long, ovoid with a curved beak, strongly tuberculate or sublamellate, densely tomentose. *Seed* obovoid; testa thin, arilliform towards the base.

2. **A. Wallichii,** *Hook. f.;* branches and leaves quite glabrous, leaflets ovate-oblong or oblong obtusely-pointed, base rounded or cordate, stamens 10, styles 5 very short. Connaracea, *Wall. Cat.* 8544.

EASTERN PENINSULA; Sincapore, *Wallich*; Malacca, *Griffith, Maingay.*

Branches and petioles slender. *Leaflets* 4–6 by 1¼–2¼ in., coriaceous, lateral shortly terminal long-petiolulate; nerves strong beneath. *Racemes* ½–1 in., densely pubescent. *Flowers* ¼ in. diam. *Stamens* and carpels stout. *Capsule* ⅓–⅔ in. long, obtusely beaked, tubercled, rusty tomentose. *Seed* oblong, testa thin.

2. ROUREA, Aubl.

Trees or shrubs. *Leaves* odd-pinnate; leaflets subopposite or alternate. *Panicles* axillary. *Flowers* small; pedicels usually slender. *Sepals* 5, orbicular, imbricate, enlarged and clasping the base of the ripe capsule. *Petals* 5, usually linear-oblong. *Stamens* 10; filaments connate at the base. *Ovaries* 5, 4 usually imperfect; style slender. *Capsule* sessile, curved. *Seed* erect, arillate, exalbuminous.—DISTRIB. Tropics; species about 50.

* Leaflets few, 1–6-pairs, petiolulate, glabrous.

1. **R. santaloides,** *W. & A. Prodr.* 144; quite glabrous, leaflets 2–4-pair 2–4 in. polished reticulated, elliptic or ovate, caudate-acuminate shining, principal nerves indistinct, base usually rounded, sepals orbicular not ciliate, ovaries glabrous. *Planch. in Linnæa,* xxiii. 418; *Dalz. & Gibs. Bomb. Fl.* 53. Connarus santaloides, *Vahl Symb.* iii. 87; *DC. Prodr.* ii. 85. C. monocarpus, *W. & A. Prodr.* 143 (*not of Linn.*). Connaracea, *Wall. Cat.* 8532.—*Burm. Thes. Zeyl.* t. 89.

WESTERN PENINSULAS; from the Concan to Travancor. CEYLON.

Leaflets 1½–3 by 1–1½ in., coriaceous, sometimes acute at the base; nerves rarely distinct from the reticulations of the leaflet and usually spreading horizontally from the midrib, but this is a very uncertain character. *Racemes* terminal and axillary, 2–4 in., simple or compound, slender; pedicels slender, ¼ in.; bracts small. *Flowers* ¼–⅓ in. diam. *Petals* twice as long as the linear-oblong sepals. *Capsule* falcate, ¾–1 in., obtuse, apiculate or pointed.

2. **R. commutata,** *Planch. in Linnæa,* xxiii. 420; quite glabrous, leaflets 2–4-pairs 3–6 in. ovate elliptic or elliptic-lanceolate caudate-acuminate shining, principal nerves usually very distinct beneath, lower pair long ascending, base usually acute, sepals orbicular not ciliate, ovaries glabrous. Cnestis monadelpha, *Roxb. Fl. Ind.* ii. 454. Connaracea ? *Wall. Cat.* 8549 (*no fl. or fruit.*). Connaracea, *Wall. Cat.* 8547, 8548.

ASSAM, SILHET, CHITTAGONG, BIRMA and southwards to TENASSERIM.—DISTRIB. China.

So similar in most respects to *R. santaloides* that I scarcely doubt its being an eastern form of that plant, distinguished by the nervation of the leaflets, which are

more usually acute at the base. Some Tavoy specimens are, however, almost intermediate.

3. **R. caudata,** *Planch. in Linnæa,* xxiii. 419; quite glabrous, leaflets 3–5 pairs elliptic-ovate with long caudate-acuminate obtuse points not shining, petiole very slender, sepals ciliolate, petals oblong obtuse.

ASSAM, *Jenkins*; KHASIA MTS., alt. 1–4000 ft., *Griffith, H. f. & T.*

Very similar to *R. santaloides,* but much smaller in all its parts and more slender, with more membranous leaflets 2–2½ in., of which the points are ¼–¾ as long as the blade, finely reticulate, not shining. *Racemes* or panicles 1–2 in. *Flowers* ⅓ in. diam. *Capsule* ¾–1 in., slightly curved, broader upwards. *Petals* not much exceeding the sepals. *Ovaries* glabrous, style short.

4. **R. pulchella,** *Planch. in Linnæa,* xxiii. 419; quite glabrous, leaflets 1–3-pair 1–1½ in. ovate-lanceolate obtusely caudate-acuminate shining, sepals suborbicular ciliolate.

MALACCA, *Griffith, Maingay.*

A smaller leaved plant than *R. caudata* with more coriaceous leaflets, which are dark chestnut-brown when dry, and have slender petiolules ⅛ in. long; they are uniformly reticulated on both surfaces without obvious principal nerves. *Panicles* very slender, often exceeding the leaves; pedicels ¼ in., capillary. *Flowers* ¼ in. diam. *Petals* twice as long as the sepals, linear-oblong, connate, just above the base. *Ovaries* 5, pilose; styles very slender. *Capsule* ½ in., stout, curved, pointed.

5. **R. acuminata,** *Hook. f.*; quite glabrous, leaflets 3–4 pair elliptic or elliptic-oblong abruptly caudate-acuminate finely reticulate on both surfaces shining above subglaucous beneath, petiole very slender. Cnestis acuminata, *Wall. Cat.* 8533 (Connaracea).

SINGAPORE, *Wallich.*

Branches slender. *Leaves* 2½–6 in.; petiole quite glabrous, petiolules very short; leaflets 1½–3 by ⅔–1¼ in., thinly coriaceous, brown when dry; base rounded. *Capsule* ¾ in.—The specimens are very imperfect.

** Leaflets very numerous, small, 1½–2½ in., sessile, oblong.

† *Leaflets very pubescent beneath.*

6. **R. rugosa,** *Planch. in Linnæa,* xxiii. 422; branches petioles leaves beneath and inflorescence softly pubescent, leaflets 6–9-pairs 1½–2½ in. oblong obtusely acuminate, base cordate, panicles stout, pedicels shorter than the calyx. Connarus? rugosus, *Wall. Cat.* 8527, Connaracea.

EASTERN PENINSULA; Singapore, *Wallich.* Penang, *Porter.* Malacca, *Griffith, Maingay.*

Branches stout, velvety. *Leaves* 1 ft.; petiole stout. *Leaflets* shining above, reticulate on both surfaces. *Panicles* shorter than the leaves. *Flowers* ¼ in. diam., rosy. *Sepals* orbicular, pubescent. *Petals* twice as long, pilose on the back. *Capsules* ½–¾ in., pointed.

7. **R. villosa,** *Planch. in Linnæa,* xxiii. 422; branches petioles and inflorescence softly pubescent, leaflets 12–20 pairs ¾ in. oblong rounded at the tip pilose beneath, panicles slender, pedicels equalling the calyx.

TENASSERIM, at Mergui, *Griffith, Helfer.*—DISTRIB. Sumatra.

Branches rather stout, velvety. *Leaves* 3–8 in.; petiole slender; leaflets faintly reticulate and polished above, base oblique subcordate. *Panicles* shorter than the leaves, clothed with dense spreading soft hairs. *Flowers* ⅛ in. diam. *Sepals* orbicular, scarcely pilose. *Petals* glabrous, linear-oblong, twice or thrice as long as the calyx. *Capsule* ½ in., curved.

8. **R. fulgens,** *Planch. in Linnæa*, xxiii. 423; branches petioles leaves beneath and panicles densely shortly pubescent, leaflets 12–20 pairs   in. linear-oblong rounded at the tip base oblique, racemes strict contracted. Connarus fulgens, (Connaracea?) *Wall. Cat.* 8524.

SINGAPORE, *Wallich*, *Maingay*.

Pubescence rusty when dry. *Leaves* 3–5 in., petiole rather stout; leaflets slightly dilated or contracted at the base, opaque, reticulation very obscure. *Racemes* (very contracted panicles) axillary, strict, shorter than the leaves; pedicels very short indeed. *Flowers* not seen. *Capsule* $\frac{3}{4}$ in., much curved, obtuse.—I do not see why Wallich proposed the trivial name of *fulgens* for this; in its dry state it is a remarkably lurid plant.

†† *Leaflets glabrous beneath or nearly so.*

9. **R. stenopetala,** *Hook f.*; petiole and midrib of leaflets beneath pubescent, leaflets 6–10 pairs $\frac{3}{4}$–1 in. obliquely ovate or obovate 2-lobed at the tip, racemes very short, pedicels slender. Cnestis steriopetala (*misprint for* stenopetala), *Griff. Notul.* iv. 433, t. 611, *f.* 2. Rourea No. 23 indescripta, *Planch. in Linnæa*, xxiii. 421.

TENASSERIM, at Mergui, *Griffith*.

Branches glabrous, branchlets pubescent. *Leaves* 2–4 in.; petiole slender; leaflets contracted cordate and very oblique at the base, shining above and below, nerves and reticulations obscure. *Racemes* apparently almost reduced to fascicles; bracts ovate, ferruginous. *Sepals* lanceolate, acute, spreading, imbricate, pubescent at the tip. *Petals* linear, very narrow, $2\frac{1}{2}$ times longer than the sepals. *Ovaries* pilose.—The flowers are described from Griffiths' Notulæ; the spreading calyx is anomalous in the genus.

10. **R. Wallichiana,** *Planch. in Linnæa*, xxiii. 421; petioles and panicles pubescent, leaflets 15–30 pairs $\frac{1}{2}$–$\frac{3}{4}$ in. linear-oblong rounded at the tip glabrous on both surfaces, racemes slender, pedicels equalling or exceeding the calyx, flowers $\frac{1}{8}$ in. diam. Connaracea, *Wall. Cat.* 8525. Connarus mimosoides, *Vahl? Wall. Cat.* 8526 D.

TENASSERIM and MARTABAN; Amherst, *Wallich*; Tavoy, *Gomez*; Moulmein, *Falconer*.

Leaves 6–10 in.; leaflets very uniform, always obtuse, base rounded or subcordate, upper surface dark brown hardly shining, lower chocolate brown opaque; nerves faint. *Racemes* slender, much shorter than the leaves, villous, paniculate at the base, pedicels very slender, exceeding the calyx. *Sepals* orbicular, ciliate. *Petals* $\frac{1}{4}$ in. long, linear, glabrous. *Capsule* $\frac{1}{2}$–$\frac{2}{3}$ in. long, curved.—A specimen of this is mixed with Wallich's 8526 B.

11. **R. concolor,** *Blume Mus. Bot.* i. 264; petioles and racemes pubescent, leaflets 15–20 pairs $\frac{1}{2}$ in. oblong rounded or retuse at the tip glabrous on both surfaces, racemes slender, pedicels about equalling the calyx, flowers $\frac{1}{4}$–$\frac{1}{3}$ in. diam. R. parvifolia, *Planch. in Linnæa*, xxiii. 420. Connarus mimosoides, *Vahl? Wall. Cat.* 8526 A.B. ? C. mimosoides, *Jack in Mal. Misc.* 2, vii. 44.

SINGAPORE, *Prince*; MALACCA, *Griffith*.—DIST. Borneo.

Branchlets finely pubescent. *Leaves* 2–6 in.; petiole slender; leaflets cordate at the base, shining above, chocolate-brown and minutely reticulated beneath. *Racemes* equalling or exceeding the leaves. *Flowers* the smallest of the Indian species. *Sepals* orbicular. *Petals* twice as long, linear-oblong. *Capsules* $\frac{1}{2}$–$\frac{2}{3}$ in., pointed.—There is a Wallichian specimen in Herb. Benth. under *Wall. Cat.* 8526 B. with the leaves shining beneath.

12. **R. similis,** *Blume Mus. Bot.* i. 264; petioles and racemes pubescent, leaflets 8–12 pairs linear-oblong 2-lobed at the tip shining above, very sparsely

pubescent or glabrate beneath, racemes slender, pedicels equalling the calyx. R. sororia and R. parallela, *Planch. in Linnæa,* xxiii. 421; Connarus mimosoides *Vahl.? Wall. Cat.* 8526 C.

EASTERN PENINSULA, Penang, *Porter*; MALACCA, *Maingay.*—DISTRIB. Sumatra, Borneo.

Branchlets pubescent. *Leaves* 3–6 in.; petiole slender; leaflets cordate at the base, usually shining above with raised nerves, or with the nerves obsolete, subglaucous beneath. *Racemes* shorter than the leaves. *Flowers* ⅓ in. diam. *Sepals* broadly oblong, very pubescent. *Petals* twice as long. *Capsule* ¾ in., much curved.

3. **ROUREOPSIS,** Planch.

Trees or shrubs. *Leaves* odd-pinnate, leaflets few. *Flowers* in axillary panicles, pedicels slender. *Sepals* oblong, slightly imbricate, somewhat enlarged and spreading, but not clasping the base of the capsule. *Petals* linear-oblong. *Stamens* 10, the alternate longer. *Ovaries* 5; styles slender. *Capsule* linear-oblong, recurved. *Seed* ovoid, testa thin black arilliform at the base; cotyledons amygdaloid.—DISTRIB. Species 2, a Javanese and Indian.

This genus, which (Gen. Pl. i. 432) when the fruit was unknown I united with *Rourea*, proves to be exarillate, and I therefore restore it.

1. **R. pubinervis,** *Planch. in Linnæa,* xxiii. 424; branchlets petioles and nerves beneath finely pubescent, leaflets 3-pairs ovate or elliptic with a contracted notched tip. Indeterminata, *Wall. Cat.* 9050.

EASTERN PENINSULA, Penang, *Porter*; Malacca, *Griffith, Maingay.*

Leaves 4–8 in.; petioles slender; leaflets, 2–4 in., alternate, petiolulate, base acute; nerves distinct, arched. *Panicles* or racemes axillary, shorter than the leaves, nearly glabrous; pedicels ¼ in. *Flowers* ½ in. diam. *Sepals* nerved, glabrous, very obtuse. *Petals* strap-shaped, three times as long. *Ovaries* pubescent. *Capsule* 1 in., nearly straight.

4. **CONNARUS,** Linn.

Trees or shrubs. *Leaves* odd-pinnate; leaflets 5, rarely 3 or more, quite entire. *Panicles* axillary and terminal, branched. *Flowers* small. *Sepals* 5, deciduous or persistent and clasping the pedicel of the capsule, not accrescent, imbricate. *Petals* 5, linear or ligulate and slightly dilated upwards. *Stamens* 10, 5 shorter and sometimes without anthers. *Ovaries* 5, densely pubescent, 4 usually imperfect or obsolete, the fifth with a slender style, stigma capitellate. *Capsule* oblique, stipitate, inflated, broader upwards; valves glabrous or pubescent within. *Seeds* arillate, testa shining, albumen 0; cotyledons amygdaloid. —DISTRIB. Species about 55, all tropical.

The structure of the flowers is remarkably uniform in all the Indian species which are with difficulty distinguished.

* Valves of the capsule quite glabrous within. Leaves quite glabrous beneath in all. *Natives of the Western Peninsula.*

1. **C. monocarpus,** *Linn.; W. & A. Prodr.* 143; leaflets elliptic or elliptic-lanceolate obtusely acuminate, nerves 3–5 pairs, very slender, filaments glabrous, capsule 1½–2 in. narrow turgid contracted into the stalk, not veined nor shining. *Planch. in Linnæa,* xxiii. 425. C. asiaticus, *Willd. Sp. Pl.* iii. 692. C. pinnatus, *Lamk. Encycl.* ii. 95; *Ill.* t. 572; *W. & A. Prodr.* 143; *Grah. Cat. Bomb. Pl.* 35; *Dalz. & Gibs. Bomb. Flor.* 53. Omphalobium pinnatum, *DC.*

Prodr. ii. 86. O. indicum, *Gærtn. Fruct.* i. 217, t. 46, fig. 3; *DC. l. c.* 85. Connaracea, *Wall. Cat.* 8539, excl. D.—*Rheede, Hort. Mal.* vi. t. 24? vii. t. 26.

WESTERN PENINSULA, from the Concan to Travancor. CEYLON, abundant.

Leaflets 3–4 by 1¼–1¾ in., glossy above, reticulations faint, quite glabrous, *Panicles* densely pubescent. *Flowers* ¼ in. long. *Sepals* ovate-oblong, subacute, pubescent. *Petals* twice as long, slightly pubescent on the back. *Longer filaments* three times as long as the shorter, all antheriferous. *Capsule* dark-coloured, rounded at both sutures, dehiscing tardily, contracted but neither acute nor apiculate at the tip. *Testa* black, shining. Very near the *C. oligophyllus* of Penang, but the capsule is quite glabrous within.—I think there can be no doubt that this, which is clearly Lamarck's *C. pinnatus*, is also Linnæus's *C. monocarpus*, which being one of the commonest plants in Ceylon, cannot have escaped Burmann's notice. Wight & Arnott describe it as having a sessile capsule, no doubt from Rheede's figure, which, if it belongs to this plant, is a very bad one, also as having a glabrous calyx, which is not the case.

2. **C. Wightii**, *Hook. f.*; leaves elliptic-ovate obtusely pointed, nerves 5-6 on each side arched slender, capsules 1½ by ¾ in. compressed, base narrowed into the stalk shining hardly pointed. Rourea? sclerocarpa, *W. & A. in Wight Cat.* 934. (See note under Pongamia, *W. & A. Prodr.* 262.)

WESTERN PENINSULA, *Wight*; the Concan, *Stocks*.

Leaflets 3–3½ by 1¼–1¾ in., coriaceous, hardly shining, finely reticulated, quite glabrous. *Capsules* pale chestnut coloured, shining, rounded, strongly striate on the ventral and dorsal faces, narrowly keeled at the sutures, early dehiscing, pale and quite glabrous within.—I have described this from a fruiting specimen. The capsule resembles that of *C. paniculatus*, but is quite glabrous within.

3. **C. Ritchiei**, *Hook. f.*; leaflets elliptic-lanceolate obtusely acuminate, nerves 5–7 on each side faint, capsule ¾ by ½ in. turgidly oblong rounded at the top, base cordate.

WESTERN PENINSULA, the Concan, *Stocks*; the Ramghat near Belgaum, *Ritchie*.

Leaflets 3–4 by 1¼–1¾ in., finely reticulated, quite glabrous. *Panicles* rusty-pubescent. *Flowers* crowded, ⅛ in. long. *Sepals* ovate-oblong. *Petals* about twice a long. *Capsule* quite as broad from suture to suture as across the valves, dark-coloured, intruded at the base, which is very rounded, and suddenly contracted into the stalk.—The capsule much resembles that of *C. latifolius*, Wall., but is more cordate at the base and larger.

** Valves of the capsules more or less pubescent or velvety within (unknown in *C. Griffithii* and *semidecandrus*.

† *Leaflets more or less pubescent beneath.*

4. **C. ferrugineus**, *Jack in Mal. Misc.* 2, vii. 37; branches panicles and leaves beneath densely rusty tomentose, leaflets 7 oblong or oblanceolate acuminate rugose, capsules 2–2½ by 1¼ in. compressed velvety narrowed into the stalk.—Connaracea, *Wall. Cat.* 8530.

EASTERN PENINSULA, Sincapore, Malacca, and Penang, *Jack, &c.*

Densely clothed with rusty velvety tomentum. *Leaflets* 3–6 by 1½ 2¼ in., thickly coriaceous, rugose, and pubescent above when young, glabrate above when old, base rounded or subcordate; petiolules very short and stout; nerves 6–8 pairs, arched, very much sunk above and raised beneath. *Panicles* shorter than the leaves, very stout. *Flowers* nearly ½ in. long. *Sepals* oblong. *Petals* twice as long, narrowly linear-spathulate. *Filaments* glabrous, shorter, half as long as the others. *Capsule* almost woody, readily dehiscing, hardly pointed, densely tomentose, valves finely pubescent within.

5. **C. Griffithii,** *Hook. f.*; branches, petioles, and leaves beneath pubescent, leaflets ovate- or elliptic-lanceolate acuminate, nerves very indistinct.

TENASSERIM, at Mergui, *Griffith.*

Branches slender. *Leaflets* 3–5 by $\frac{3}{4}$–$1\frac{1}{2}$ in., thinly coriaceous, finely pubescent with rusty hairs beneath, midrib distinct; nerves very faint, oblique. *Panicles* rusty-pubescent. *Flowers* $\frac{1}{8}$ in. long. *Sepals* linear-oblong. *Petals* more than twice as long, glabrous, ligulate. *Filaments* almost glabrous. *Capsule* unknown.

6. **C. semidecandrus,** *Jack in Mal. Misc.* 2, vii. 39; branches, petioles, and midrib beneath finely pubescent, leaflets elliptic-oblong acute, thinly coriaceous, not reticulated, nerves 5 pairs very slender. C. floribundus, *Wall. in Herb. Linn. Soc. sub* 8543.

TENASSERIM at Mergui, *Griffith*; PENANG, *Wallich, Phillips, &c.*

Leaflets pale on both surfaces. *Panicle* much branched, thinly pubescent. *Flowers* $\frac{1}{6}$ in. long, white (Wallich). *Sepals* linear-oblong. *Petals* more than twice as long, narrow, linear-spathulate, glabrous. *Filaments* nearly glabrous. *Capsule* not seen.

†† *Leaflets perfectly glabrous beneath.*

7. **C. paniculatus,** *Roxb. Fl. Ind.* iii. 139; leaflets 3–7 elliptic-oblong, -ovate or -lanceolate with a short or long obtuse point, petals glabrous, filaments puberulous, capsules $1\frac{1}{4}$–$1\frac{1}{2}$ by $\frac{2}{3}$–$\frac{3}{4}$ in. contracted into the stalk compressed, seed oblong compressed. ? C. pentandrus, *Roxb. l. c.* 140.—Connaracea, *Wall. Cat.* 8540 (excl. E.).

SILHET and the KHASIA MTS., ascending to 2000 ft., *Roxburgh*, &c.; CHITTAGONG, *Roxburgh, H. f. & T.*

A large climber; branches and leaves perfectly glabrous. *Leaflets* 3–8 by 1–2 in., coriaceous, glossy above; nerves 5–6 pairs, slender, faint, reticulations obscure; petiole stout. *Panicle* hoary, much branched and spreading. *Flowers* $\frac{1}{6}$ in. long. *Sepals* linear-oblong, pubescent. *Petals* more than twice as long, nearly glabrous, linear. *Longer filaments* three times as long as the short ones. *Capsule* shining, pale, deeply striate, finely pubescent within.—I do not see how *C. pentandrus*, Roxburgh, differs except in being described as truly pentandrous.

8. **C. gibbosus,** *Wall. in Herb. Linn. Soc. sub* 8541; leaflets elliptic-oblong or -ovate obtusely acuminate nerves 5–6 pairs, capsules 1 by $\frac{1}{2}$ in. hatchet-shaped compressed with a horizontal beak on the outer edge. Connaracea, *Wall. Cat.* 8538, B (in part) ? 8540 E, 8541, 8541 B. Sapind. dub. *Wall. Cat.* 8098.

BIRMA, at Rangoon, *McLelland*; TENASSERIM, at Mergui, *Griffith*, &c.; PENANG, *Porter*; MALACCA, *Griffith, Maingay*; SINGAPORE, *Wallich.*—DISTRIB. Borneo.

Leaflets 3–5 by $1\frac{1}{2}$–$2\frac{1}{2}$ in., quite glabrous; transverse venules distinct beneath. *Panicles* branched, rather slender. *Flowers* $\frac{1}{6}$ in. *Sepals* ovate-oblong. *Petals* about twice as long. *Filaments* puberulous. *Capsules* compressed, broad, veined, with the beak, usually very pronounced at the outer edge of the broad top; valves finely pubescent within.—Wallich suggests that this may be Jack's *C. lucidus* or *C. grandis.*

9. **C. Championii,** *Thwaites Enum.* 80; leaflets 5–7 elliptic acuminate, nerves 5–6 pairs very strong beneath, capsules $1\frac{1}{2}$ by $\frac{3}{4}$ in. semilunar compressed narrowed at the base but not distinctly stalked striate glabrous.

CEYLON; Central province, ascending to 4000 ft.

A climbing shrub; young parts clothed with rusty pubescence. *Leaflets* 3–5 by $1\frac{3}{4}$–$2\frac{1}{2}$ in., thinly coriaceous, polished on both surfaces, reticulate beneath; petiole and petiolules slender. *Panicles* axillary and terminal, 4–6 in., minutely rusty-pubescent. *Flowers* $\frac{1}{4}$ in. long. *Sepals* oblong, hairy. *Petals* twice as long, linear-obovate, white dotted with red, sparsely hairy. *Filaments* included, glabrous, the longer twice as long as the shorter. *Capsule* apiculate, sutures not keeled; valves thin with scattered hairs within.

10. **C. latifolius,** *Wall. Cat.* 8537 (by error 5837); leaflets elliptic-oblong with contracted obtuse or notched points, capsule $\frac{3}{4}$ by $\frac{1}{3}$ in. shortly subcylindric very turgid abruptly contracted into the stalk, top rounded scarcely apiculate. Connaracea ? 8545.

MARTABAN, at Moulmein, *Wallich.* TENASSERIM, at Tavoy, *Gomez.*

Leaflets 4–7 by $1\frac{1}{2}$–3 in., coriaceous, quite glabrous; nerves 5 pairs, slender, arched, reticulations indistinct. *Panicles* widely spreading. *Flowers* $\frac{1}{6}$ in. long. *Capsules* with very round tops, and an obscure sublateral point, finely puberulous within.

11. **C. grandis,** *Jack in Mal. Misc.* 2, vii. 40; leaflets 8–14 in. elliptic-oblong obtuse or obtusely acuminate thickly coriaceous polished, nerves 8–10 pairs, capsules 2 by $\frac{3}{4}$–1 in. contracted into the stalk turgid woody. *Planch. in Linnæa,* xxiii. 429. C. Wallichii, *Planch. in Linnæa,* xxiii. 426. Connaracea, *Wall. Cat.* 8538, A, B (in part).

EASTERN PENINSULA, Sincapore and Penang, *Wallich*; MALACCA, *Griffith, Maingay*; TENASSERIM OR ANDAMAN ISLANDS, *Helfer.*

Branches and *petioles* very robust, quite glabrous. *Leaflets* 3–5, much the largest, most coriaceous and polished of the genus, transverse nerves distinct beneath; petiolules short, stout. *Panicles* spreading, clothed with hoary down. *Flowers* $\frac{1}{4}$ in. long. *Sepals* linear-oblong, obtuse. *Petals* twice as long, almost glabrous, linear, dilated upwards. *Filaments* puberulous, longer, three times as long as the others. *Capsule* coarsely striated, glabrous, sutures rounded, not keeled or raised.

12. **C. Maingayi,** *Hook. f.*; leaflets ovate or elliptic-ovate obtusely acuminate very coriaceous pale, nerves very faint, capsules 1–$1\frac{1}{2}$ by $\frac{1}{3}$ in. elliptic or subcylindric, stalk obscure.

EASTERN PENINSULA; MALACCA, *Maingay.*

Branches rather stout, glabrous. *Leaflets* 5, 3–5 by $1\frac{1}{4}$–$2\frac{1}{2}$ in., closely finely reticulated, opaque and pale grey on both surfaces. *Panicles* hoary-pubescent. *Flowers* $\frac{1}{4}$ in. long. *Sepals* small, ovate-lanceolate. *Petals* three times as long, linear, with black dots, hoary on both surfaces. *Capsules,* young, $1\frac{1}{2}$ by $\frac{1}{3}$ in., terete, grooved at both sutures, top rounded and mucronate, striæ quite longitudinal; old more elliptic; valves woody, velvety within.—Very near and perhaps identical with *C. falcatus,* Blume of Borneo. I find great varieties in the capsules of Maingay's specimens, in part I assume depending on age; the longer are almost straight and subcylindric and $\frac{1}{3}$ in. diam.; the shorter are ellipsoid and $\frac{3}{4}$ in. diam.; a few are $2\frac{1}{2}$ in. long, curved and more distinctly stalked, as in Blume's *falcatus.*

13. **C. oligophyllus,** *Planch. in Linnæa,* xxiii. 427; leaflets elliptic-lanceolate obtusely acuminate lower 2–3 pairs of nerves prominent beneath, panicle hoary-pubescent, capsule $1\frac{1}{4}$–$1\frac{1}{2}$ by $\frac{1}{3}$ in. fusiform-clavate symmetrical apiculate obscurely stalked grooved on one face. Connaracea, *Wall. Cat.* 8542 (in part) and 8539, D (in part).

PENANG, *Porter.*

Branches and *leaves* quite glabrous. *Leaflets* 5, 4–7 by $1\frac{1}{2}$–$2\frac{1}{2}$ in.; base acute, thinly coriaceous, shining on both surfaces, pale red-brown beneath, the lowest pair of nerves quite basal, the succeeding pairs distant, all very oblique; petiole and petiolules slender. *Panicle* subpyramidal, nearly black; branches slender, ascending, rufous-pubescent. *Flowers* $\frac{1}{4}$ in. long. *Sepals* oblong, obtuse, hoary. *Capsules* nearly straight, dark brown, smooth, striated longitudinally, tip rounded, apiculate; valves coriaceous, finely pubescent within.—The sheet of 8539 D. in Wall.'s Herb. contains three fragments of this plant without fruit, one flowering specimen of 8539 A (*C. paniculatus*), and three capsules of the same (glabrous inside). The sheet of 8542 consists of flowering specimens of this; and 8542 B. consists of this and *C. paniculatus* or *monocarpus.* The specimen given to Bentham by Wallich is in fine fruit. This seems to differ entirely from *C. Maingayi* in the foliage, large panicle, and sepals.

DOUBTFUL SPECIES.

C. SPECIES? leaflets 5-8 in. elliptic and stout, branches almost black and very polished, nerves 7-8 pair very strong beneath, panicle slender hoary, sepals ovate-lanceolate, petals glabrous.—Sincapore or Penang, *Walker.*

C. SPECIES? leaflets as in *C. pinnatus*, but nerves beneath very strong.—Anamallay hills, alt. 3000 ft., *Beddome.*

CONNARUS? VELUTINUS, *Wall. Cat.* 8536, consists of foliage and diseased fruit of a *Spatholobus*, with one capsule of *Ellipanthus tomentosus*, H. f.

CONNARUS? JACKIANUS, *Wall. Cat.* 8552, is Cupania Jackiana, *Hiern.*

CONNARUS MIMOSOIDES, *Vahl Symb.* iii. 87; *DC. Prodr.* ii. 85, from the Nicobar Islands is indeterminate from description.

5. CNESTIS, Juss.

Shrubs or trees. *Leaves* odd-pinnate; leaflets many, quite entire. *Flowers* solitary, fascicled or racemed, tomentose, rarely panicled, polygamous or diœcious, rotate. *Sepals* 5, valvate or imbricate at the tip, spreading in fruit. *Petals* 5, shorter or longer than the calyx. *Stamens* 10, free. *Ovaries* 5–7, sessile; styles short, stigmas capitellate. *Capsules* 1–3, kidney-shaped, cylindric curved or waved, pubescent, often villous or clothed with rigid hairs within. *Seed* exarillate, albumen fleshy; cotyledons thin.—DISTRIB. Tropical Asia and Africa; species about 10.

1. **C. ramiflora,** *Griff. Notul.* iv. 432; softly tomentose or villous, leaflets 12–15-pairs linear-oblong, tip rounded obtuse or subacute, base rounded or cordate. C. flaminea, *Griff. l.c.* 433, t. 608, f. 2. C. platantha, *Griff. l.c.* 434; *Kurz in Jour. As. Soc. Beng.* 1870, pt. ii. 75. Connarus foliolosus, *Jack in Wall. Cat.* 8529. C. igneus, *Wall. Cat.* 8528, (Connaracea). Rourea dasyphylla, *Miq. Fl. Ind. Bat. Suppl.* 528.

BIRMA, at Amherst, Chappedong and Rangoon, *Wallich.* TENASSERIM, at Mergui, *Griffith.* MOULMEIN and the S. ANDAMANS, *Kurz,* &c. PENANG, MALACCA and SINCAPORE, *Wallich, Griffith,* &c.—DISTRIB. Sumatra, Philippine Islands.

A climbing shrub. *Branches* stout, woody. *Leaves* 1 ft.; petiole slender, pubescent; leaflets subsessile, $1\frac{1}{2}$–3 in., sometimes contracted below the middle, glabrous and shining above; nerves 6–10 pairs, slender, arched. *Panicles* axillary, fascicled, slender, much shorter than the leaves, densely clothed with pale soft tomentum. *Flowers* ♂ $\frac{1}{3}$ in. diam., rosy, ♀ smaller. *Sepals* linear-oblong, obtuse. *Petals* shorter in the ♂, longer in the ♀, linear-oblong, obtuse or emarginate, glabrous. *Filaments* slender, glabrous. *Ovaries* 5–7 (usually 6, Griffith), hirsute; styles short. *Capsules* 1–3 in. long, sessile, falcate, enlarged and tumid above the middle, obtuse, woody, rugged; valves thickly woody, velvety within. *Seed* short, broad, compressed, testa thin.—I think there can be no doubt but that this answers to the three species of *Cnestis* described by Griffith and cited above, though his names are not attached to any of his specimens. It has been distributed as *Cnestis foliolosus* and *C. igneus*, Planch. MSS. in Herb. Hook.

6. TÆNIOCHLÆNA, Hook. f.

A rambling shrub. *Leaves* odd-pinnate, glabrous; leaflets 5, quite entire. *Panicles* axillary, short. *Flowers* hermaphrodite. *Calyx-tube* short, hemispheric, segments 5, enlarged and revolute in fruit, valvate. *Petals* 5, much exceeding the calyx. *Stamens* 10, alternately shorter, nearly free at the base. *Ovaries* 5,

sessile; styles short, stigmas discoid. *Capsules* 1–3, ovoid, compressed, pubescent; valves glabrous within. *Seed* oblong, arillate; albumen 0; cotyledons plano-convex.

1. **T. Griffithii,** *Hook. f. in Benth. & Hook. Gen. Pl.* i. 434.

MALACCA, *Griffith, Maingay.*

Branches rather slender, quite glabrous. *Leaflets* 3–7 by 1½–3 in., sometimes almost orbicular, base usually cordate, shining above and beneath, nerves 3–5 pairs, arched; petiolules very short. *Racemes* 2–3 in., fascicled, densely pubescent, slender. *Flowers* rotate, ⅓ in. diam. *Sepals* oblong, pubescent, recurved in flower. *Petals* twice as long, linear, dilated upwards, glabrous. *Filaments* short, subulate. *Capsules* 2–3, ½–1 in., obtuse, densely pubescent, valves coriaceous. *Seed* short, slightly compressed, testa black.

7. ELLIPANTHUS, Hook. f.

Trees or shrubs. *Leaves* with 1 leaflet, quite entire. *Racemes* axillary, short. *Flowers* hermaphrodite or polygamous. *Sepals* 5, not enlarged in fruit, suberect, valvate. *Petals* 5, longer than the sepals, oblong-lanceolate, densely pubescent. *Stamens* 10, 5 shorter, without anthers, filaments short subulate connate at the base. *Ovary* 1, strigose; style short. *Capsule* stalked, oblique, velvety; valves glabrous within. *Seed* arillate, albumen 0; cotyledons plano-convex.—DISTRIB. Malayan Peninsula and Islands.

* *Leaves glabrous beneath or nearly so.*

1. **E. Thwaitesii,** *Hook. f.*; leaflet elliptic obtusely caudate-acuminate, capsule curved into a semicircle beaked densely closely pubescent. Connarus unifoliatus, *Thwaites Enum.* 80 and 410.

CEYLON, Central Province, at 3–4000 ft. *Thwaites*

A moderate sized tree; branches slender, black. *Leaflet* 2–3½ by 1–1¾ in., reticulate; petiole and petiolule ¼–½ in., slender. *Racemes* 4–7-flowered, pubescent, bracts deciduous. *Flowers* subdiœcious, ¼ in. diam., green. *Sepals* acute. *Petals* twice as long. *Capsule* 1½ in. long, compressed, woody.

2. **E. Helferi,** *Hook. f.*; leaflet elliptic-lanceolate or linear-lanceolate acuminate, nerves 5–7 pairs strong beneath.

TENASSERIM OR ANDAMAN ISLANDS; *Helfer.*—DISTRIB. Borneo.

Branches slender, black. *Leaves* 4–7 by 1½–2½ in., very variable in length and breadth, thinly coriaceous, with slight pubescence on the petiole and midrib beneath; petiole slender, ½ in. *Racemes* ¼–⅓ in., pubescent. *Flower-buds*, ⅛ in. long. *Fruit* unknown.

3. **E. calophyllus,** *Kurz Andam. Rep. Append. B.* 6; and in *Beng. As. Soc. Jour.* 1872, ii. 305; leaflet ovate ovate-lanceolate or elliptic long-acuminate quite glabrous, nerves 6–7 pairs very slender.

ANDAMAN ISLANDS, *Kurz.*

A tree 20–30 ft.; shoots and buds pubescent. *Leaflet* 5–7 by 2–2½ in., coriaceous, finely reticulated, gradually narrowed to the obtusely acuminate tip, pale; petiole slender, ¾–1 in. *Racemes* ½ in., densely pubescent. *Petals* ¼ in., densely pubescent, linear-oblong. *Capsules* ¾–1 in., obovoid or ellipsoid, subacute, densely velvety; valves woody, glabrous within.—The description of the petals and inside of the capsule is taken from Kurz.

** *Leaves pubescent or tomentose beneath.*

4. **E. tomentosus,** *Kurz in Jour. As. Soc. Beng.* 1870, pt. ii. 305; leaflet elliptic ovate or orbicular obtuse acute or obtusely acuminate densely pubescent beneath, nerves 6–8 pairs very slender. Connarus? monophyllus, *Wall. Cat.* 8551 (Connaracea).

PEGU, MARTABAN, and TENASSERIM, *Wallich.*, &c.—DISTRIB. Siam.
Branches densely tomentose with fulvous hair. *Leaflets* 4–6 by 2–3½ in., usually elliptic or elliptic-lanceolate, but often broader and sometimes quite orbicular, coriaceous, glabrous, shining and very finely reticulated above; petiole ⅓–½ in. *Racemes* ½ in., densely tomentose. *Flowers* ¼ in. diam. *Sepals* obtuse. *Petals* twice as long, oblong, obtuse. *Filaments* hairy. *Ovary* strigose. *Capsule* 1½ in. (2 in., Kurz), semicircular or obovoid, contracted into the stout stalk, obtuse, apiculate, densely velvety, sutures rounded, valves woody, glabrous within.

5. **E. Griffithii,** *Hook. f.*; leaves ovate-lanceolate caudate-acuminate rusty-pubescent beneath, nerves 8–10 pairs strong beneath.

MALACCA, *Griffith.*—DISTRIB. Borneo.
Branches slender, rusty pubescent or tomentose. *Leaflet* 4–5 by 1½–2 in., coriaceous, glabrous and shining above, tomentose chiefly on the nerves beneath; petiole ⅙–¼ in. *Racemes* ¼ in., few-flowered. *Capsules* ¾ in. long, curved, semicircular, beaked, densely clothed with rusty velvety tomentum, stalk very short, valves woody, glabrous within.

ORDER L. LEGUMINOSÆ. (By J. G. Baker, F.L.S.)

Herbs, shrubs, or trees. *Leaves* stipulate and usually alternate, pinnate or digitate or simple, often stipellate, sometimes with the rachis ending in a tendril. *Inflorescence* axillary leaf-opposed or terminal, usually simply racemose or panicled; bracts and bracteoles usually both present. *Flowers* usually irregular, hermaphrodite, rarely regular or polygamous. *Sepals* 5, combined or free, often unequal, sometimes combined into two lips. *Petals* 5, rarely fewer by arrest, usually free and unequal. *Stamens* normally ten, perigynous or almost hypogynous, rarely fewer by arrest or indefinite; filaments free or variously combined. *Anthers* 2-celled, the dehiscence almost always longitudinal. *Ovary* free; style simple, cylindrical, usually declinate; stigma capitate, terminal or oblique. *Ovules* one or more on the ventral suture. *Fruit* usually dry, a pod splitting open along both sutures, sometimes continuous and indehiscent, at others separating into 1-seeded joints. *Seeds* usually exalbuminous; cotyledons foliaceous or amygdaloid, with a straight or inflexed accumbent radicle.—DISTRIB. One of the most cosmopolitan of natural orders, the second largest of flowering plants, containing between 6000 and 7000 known species. Of the three suborders it is only the first that is cosmopolitan, the two others not reaching beyond the tropical and warm temperate zones.

SUBORDER I. *PAPILIONACEÆ.* *Corolla* papilionaceous. *Petals* irregular, imbricated, the uppermost (standard) outermost, the four others in two opposite pairs. *Stamens* definite.

Tribe I. **Podalyrieæ.** *Stamens* free. *Pod* dehiscent. *Leaves* digitate.

Shrub with connate stipules . . . . 1. PIPTANTHUS.
Herbs with free stipules . . . . 2. THERMOPSIS.

Tribe II. **Genisteæ.** *Stamens* monadelphous. *Pod* dehiscent, not jointed. *Leaves* simple or digitately 3-foliolate.

* *Anthers uniform. Keel petals scarcely cohering.*

3. Rothia.

** *Anthers dimorphous. Keel petals firmly cohering.*

Leaflets entire, subsessile.
Keel obtuse.
Calyx 2-lipped . . . . 4. Argyrolobium.
Calyx subequally 5-toothed . . . . . . 5. Lotononis.
Keel beaked.
Pod flattened.
Flowers solitary in axils of leaves . . . . . 6. Heylandia.
Flowers in terminal racemes . . . . . . 7. Priotropis.
Pod turgid . . . . 8. Crotalaria.
Leaflets toothed, stalked . . . . 9. Ononis.

Tribe III. **Trifolieæ.** *Stamens* diadelphous. *Pod* usually dehiscent, not jointed. *Leaves* digitately or pinnately 3-foliolate; leaflets usually toothed.

* *Leaves digitately 3-foliolate.*

Petals persistent, adnate to the staminal tube . . . . 10. Trifolium.
Petals caducous, free from the staminal tube . . . . 11. Parochetus.

** *Leaves pinnately 3-foliolate.*

Pod elongated, straight or recurved . . . . . . 12. Trigonella.
Pod short, round, or oblong . . . . 13. Melilotus.
Pod falcate or spiral . . . . 14. Medicago.

Tribe IV. **Loteæ.** *Stamens* diadelphous. *Pod* dehiscent, not jointed. *Leaves* pinnately 5-foliolate; leaflets entire.

15. Lotus.

Tribe V. **Galegeæ.** *Stamens* usually diadelphous. *Pod* dehiscent, not jointed. *Leaves* imparipinnate; leaflets entire.

* *Anthers apiculate. Hairs fixed by the centre.*

Stamens monadelphous . . . . 16. Cyamopsis.
Stamens diadelphous . . . . 17. Indigofera.

** *Anthers obtuse. Hairs basifixed.*

Pod 1-seeded, indehiscent. Leaves gland-dotted . . . . 18. Psoralea.
Pod few- or many-seeded, subindehiscent or late in dehiscing.
Filaments filiform.
Pod membranous, inflated . . . . 19. Colutea.
Pod woody or very firm . . . . 20. Millettia.
Filaments dilated . . . . 21. Mundulea.
Pod many-seeded, soon dehiscing.
Flowers mostly in leaf-opposed racemes . . . . . 22. Tephrosia.
Flowers mostly in axillary racemes.
Pod very long, distinctly septate . . . . . . 23. Sesbania.
Pod linear or oblong, not septate.
Calyx very oblique . . . . 24. Caragana.
Calyx not oblique.
Keel very short, obtuse . . . . 25. Guldenstædtia.
Keel long, obtuse . . . . 26. Astragalus.
Keel long, appendiculate . . . . 27. Oxytropis.

Tribe VI. **Hedysareæ.** *Stamens* diadelphous or monadelphous. *Pod* jointed if more than 1-seeded. *Leaves* odd-pinnate.

* *Leaves exstipellate.*

Stamens monadelphous; anthers uniform.
  Leaflets 1–3. Flowers in a lax raceme . . . . . 28. TAVERNIERA.
  Leaflets 3. Flowers in a dense head . . . . . 29. EBENUS.
  Leaflets 4 . . . . 30. GEISSAPSIS.
  Leaflets many . . . . 31. ONOBRYCHIS.
Stamens diadelphous (9 and 1); anthers uniform.
  Ovule solitary. Pod 1-jointed . . . . 32. LESPEDEZA.
  Ovules few.
    Spiny shrub, with simple leaves . . . . . . 33. ALHAGI.
    Herbs with imparipinnate leaves.
      Pod distinctly jointed . . . . 34. HEDYSARUM.
      Pod marked only by faint transverse lines . . 35. STRACHEYA.
Stamens monadelphous; anthers dimorphous.
  Joints of pod 2–6, muricated . . . . 36. ZORNIA.
  Joints of pod 1–2, rugose . . . . 37. STYLOSANTHES.
Stamens in two bundles of 5 each; anthers uniform.
  Pod twisted inside the calyx . . . . 38. SMITHIA.
  Pod straight exserted from the calyx.
    Calyx 2-lipped . . . . 39. ÆSCHYNOMENE.
    Calyx 5-toothed . . . . 40. ORMOCARPUM.

** *Leaves stipellate.* (Stamens in all 9 and 1; anthers uniform.)

Ovary 1-ovuled.
  Racemes terminal, capitate . . . . 41. LEPTODESMIA.
  Racemes axillary, lax . . . . 42. ELEIOTIS.
Ovules several. Pod not distinctly jointed.
  Pod turgid . . . . 43. PYCNOSPORA.
  Pod flat . . . . 44. PSEUDARTHRIA.
Ovules 2 or more. Pod distinctly jointed.
  Pod twisted up so that the joints are brought face to face.
    Calyx accrescent; teeth lanceolate . . . . . 45. LOUREA.
    Calyx not accrescent; teeth setaceous . . . . 46. URARIA.
  Pod not twisted up.
    Joints turgid . . . . 47. ALYSICARPUS.
    Joints flattened.
      Pedicel abruptly inflexed at the tip . . . . 48. MECOPUS.
      Pedicel not inflexed.
        Racemes in fascicles from the old wood . . . 49. OUGEINIA.
        Racemes simple or panicled from the year's shoots . 50. DESMODIUM.

Tribe VII. **Vicieæ.** *Stamens* diadelphous (the tenth abortive in Abrus). *Pod* dehiscent, not jointed. *Leaves* equally pinnate; petiole ending in a tendril or bristle.

Shrubs with the tenth stamen absent . . . . . . 51. ABRUS.
Herbs with diadelphous stamens (9 and 1).
  Leaflets toothed . . . . 52. CICER.
  Leaflets entire.
    Tube of stamens oblique at mouth . . . . . 53. VICIA.
    Tube of stamens truncate at mouth . . . . . 54. LATHYRUS.

Tribe VIII. **Phaseoleæ.** *Stamens* monadelphous or diadelphous. *Pod* dehiscent, not jointed. Climbing, rarely erect herbs or shrubs, with pinnately 3-foliolate leaves.

Subtribe I. GLYCINEÆ. *Leaves* not gland-dotted; leaflets stipellate. *Nodes* of racemes not tumid. *Flowers* small. *Petals* about equal in length. *Style* beardless.

* *Stamens diadelphous. Stipules and bracts conspicuous persistent.*

Style filiform. Calyx-teeth distinct.
 Standard spurred. Flowers dimorphic . . . . . 55. AMPHICARPÆA.
 Standard not spurred. Flowers uniform . . . . . 56. SHUTERIA.
Style flattened upwards. Calyx truncate . . . . . 57. DUMASIA.

** *Stamens monadelphous. Stipules and bracts minute caducous.*

Anthers uniform, all fertile . . . . 58. GLYCINE.
Alternate anthers abortive . . . . 59. TERAMNUS.

Subtribe II. ERYTHRINEÆ. *Leaves* not gland-dotted; leaflets stipellate. *Nodes* of racemes tumid. *Flowers* conspicuous. *Petals* very unequal. *Style* beardless.

Keel exceeding the wings and standard.
 Anthers dimorphous . . . . 60. MUCUNA.
 Anthers uniform . . . . 61. APIOS.
Standard exceeding the keel and wings . . . . . 62. ERYTHRINA.
Standard and keel equal; wings short . . . . . . 63. STRONGYLODON

Subtribe III. GALACTIEÆ. *Leaves* not gland-dotted; leaflets stipellate. *Nodes* of racemes tumid. *Petals* equal. *Style* beardless.

* *Stamens diadelphous.*

Herbs.
 Two upper calyx-teeth not fused . . . . 64. GRONA.
 Two upper calyx-teeth fused into one.
  Keel nearly straight . . . . 65. GALACTIA.
  Keel semicircular . . . . 66. COCHLIANTHUS.
Shrubs.
 Pod 1-seeded, not winged.
  Flowers small, panicled . . . . 67. SPATHOLOBUS.
  Flowers large, racemose . . . . 68. BUTEA.
 Pod many-seeded, winged . . . . 69. MASTERSIA.

** *Stamens monadelphous.*

Upper lip of calyx projecting . . . . 70. CANAVALIA.
Upper teeth of calyx not projecting.
 Pod oblong, turgid, 1–2-seeded . . . . . . 71. DIOCLEA.
 Pod linear, flat, many-seeded . . . . 72. PUERARIA.

Subtribe IV. EUPHASEOLEÆ. *Leaves* not gland-dotted. *Stamens* diadelphous. *Style* bearded below the stigma.

* *Stigma oblique.*

Keel spiral . . . . 73. PHASEOLUS.
Keel not spiral. Style filiform . . . . 74. VIGNA.
Keel not spiral. Style flat upwards . . . . . . 75. PACHYRHIZUS.

** *Stigma terminal.*

Petals very unequal in length . . . . 76. CLITORIA.
Petals equal in length. Pod flattish . . . . . . 77. DOLICHOS.
Petals equal in length. Pod square, 4-winged . . . . 78. PSOPHOCARPUS.

Subtribe V. CAJANEÆ. *Leaves* gland-dotted below; stipellæ often abortive. *Nodes* of raceme not tumid. *Style* not bearded.

* *Ovules* 3 *or more.*

Pod with depressed lines between each seed.
  Seeds with a large grooved aril . . . . . . 79. ATYLOSIA.
  Aril absent . . . . 80. CAJANUS.
Pod without depressed lines between the seeds . . . . 81. DUNBARIA.

** *Ovules* 1–2.

Calyx-teeth accrescent . . . . 82. CYLISTA.
Calyx-teeth not accrescent.
  Funiculus at the end of the hilum . . . . . . 83. ERIOSEMA.
  Funiculus centric on the hilum.
    Leaves pinnate. Pod compressed . . . . . . 84. RHYNCHOSIA.
    Leaves digitate. Pod turgid . . . . . . 85. FLEMINGIA.

Tribe IX. **Dalbergieæ.** *Stamens* monadelphous or diadelphous. *Pod* continuous, indehiscent. *Leaves* odd-pinnate.

* *Leaflets distinctly alternate.*

Flowers small, white or reddish . . . . 86. DALBERGIA.
Flowers large, yellow . . . . 87. PTEROCARPUS.

** *Leaflets opposite.*

Pod flat, almost woody, wingless . . . . 88. PONGAMIA.
Pod flat, thin, firm, winged down one or both sutures . . 89. DERRIS.
Pod round, subdrupaceous . . . . 90. EUCHRESTA.

Tribe X. **Sophoreæ.** *Stamens* free. *Pod* not jointed. *Leaves* odd-pinnate, rarely simple.

Leaves simple. Bract and bracteoles large, opposite, persistent . . . . 91. DALHOUSIEA.
Leaves odd-pinnate. Bracts and bracteoles small, caducous.
  Stigma terminal.
    Pod moniliform . . . . 92. SOPHORA.
    Pod equal, flat, membranous . . . . 93. CALPURNIA.
  Stigma oblique.
    Pod indehiscent, flattish, narrowly winged . . . . 94. PERICOPSIS.
    Pod turgid, dehiscent, fleshy or coriaceous . . . 95. ORMOSIA.

SUBORDER II. *CÆSALPINIEÆ.* *Petals* imbricate, slightly unequal, the upper innermost in bud. *Stamens* definite.

Tribe XI. **Eucæsalpinieæ.** *Leaves* ample, abruptly bipinnate.

* *Calyx-disk sub-basal; sepals imbricated.*

Sutures of pod not winged . . . . 96. CÆSALPINIA.
Both sutures of pod winged . . . . 97. PELTOPHORUM.
Upper suture of pod winged . . . . 98. MEZONEURON.
Pod samaroid . . . . 99. PTEROLOBIUM.

** *Calyx-disk sub-basal; sepals valvate.*

Pod thin, flat . . . . 100. POINCIANA.
Pod turgid, moniliform . . . . 101. PARKINSONIA.

*** *Calyx-disk placed considerably above the base.*

. . . 102. WAGATEA.

See also MEZONEURON, § *Tubicalyx*.

Tribe XII. **Cassieæ.** *Leaves* simply pinnate. *Calyx-tube* short; disk subbasal.

Petals 5. Anthers mostly dehiscing by a terminal pore . 103. CASSIA.
Petals 5. Anthers dehiscing longitudinally . . . . 104. CYNOMETRA.
Petal 1. Stamens diadelphous (9 and 1) . . . . . 105. SINDORA.
Petals none.
  Stamens 2. Leaves unequally pinnate . . . . . 106. DIALIUM.
  Stamens 10. Leaves equally pinnate.
    Sepals usually 5 . . . . 107. HARDWICKIA.
    Sepals 4 . . . . 108. CRUDIA.

Tribe XIII. **Amherstieæ.** *Leaves* equally pinnate. *Disk* at the top of a prolonged calyx-tube.

Petals none . . . . 109. SARACA.
Petals 3–5.
  Stamens diadelphous (9 and 1) . . . . . . 110. AMHERSTIA.
  Stamens monadelphous, only 3 developed . . . . 111. TAMARINDUS.
  Stamens 5, free, equal . . . . 112. HUMBOLDTIA.
  Stamens 3–8, free . . . . 113. AFZELIA.

Tribe XIV. **Bauhinieæ.** *Leaves* simple, mostly deeply 2-lobed.

. . . 114. BAUHINIA.

SUBORDER III. *MIMOSEÆ.* *Petals* regular, valvate, usually united above the base. *Stamens* definite or indefinite.

Tribe XV. **Mimoseæ.** *Stamens* definite, usually ten.

* *Anthers at first gland-crested.*

Herbs with flowers in round heads . . . . . . 115. NEPTUNIA.
Tree with flowers in round heads . . . . . . 116. XYLIA.
Shrubs or trees with flowers in spikes.
  Climber with tendrils . . . . 117. ENTADA.
  Erect without prickles . . . . 118. ADENANTHERA.
  Erect prickly.
    Pod turgid with a thick mesocarp . . . . . 119. PROSOPIS.
    Pod thin, coriaceous, finally twisted . . . . 120. DICHROSTACHYS.
    Pod long, thin, flat . . . . 121. PIPTADENIA.

** *Anthers not gland-crested.*

Stamens 10.
  Calyx-teeth imbricate. Stamens monadelphous . . . 122. PARKIA.
  Calyx-teeth valvate. Stamens free.
    Pod ligulate, coriaceous, continuous.
      Undershrub with clavate stigma . . . . . 123. DESMANTHUS.
      Tree with capitate stigma . . . . . . 124. LEUCÆNA.
    Pod jointed . . . . 125. MIMOSA.
Stamens 5 . . . . 126. ACROCARPUS.

Tribe XVI. **Acacieæ.** *Stamens* indefinite.

Stamens free . . . . 127. ACACIA.

Stamens monadelphous.
Leaves bipinnate.
Pod thin, ligulate, the sutures not thickened . . . . 128. ALBIZZIA.
Pod large, turgid, oblong, indehiscent, the sutures not thickened . . . . 129. SERIANTHES.
Pod rather falcate, the sutures much thickened . . 130. CALLIANDRA.
Pod circinate . . . . 131. PITHECOLOBIUM.
Leaves simply pinnate . . . . 132. INGA.

1. PIPTANTHUS, D. Don.

A shrub. *Leaves* digitately 3-foliolate. *Flowers* racemed, bracteate. *Calyx-tube* campanulate; teeth equal, lanceolate. *Corolla* three times the calyx; petals all with long claws; standard orbicular, erect, margins reflexed; wings obovate; keel-petals obovate-oblong, connate down the back, slightly incurved. *Stamens* free; anthers uniform. *Ovary* linear, stalked, downy, 6–10-ovulate; style filiform, incurved; stigma minute terminal. *Pod* linear, flattened, continuous within.—DISTRIB. A single endemic species.

1. **P. nepalensis,** *D. Don in Sweet, Brit. Flower Gard.* t. 264; *Brand. For. Flor.* 132. Thermopsis nepaulensis, *DC. Prodr.* ii. 99. T. laburnifolia, *Don Prodr.* 239. Baptisia? nepalensis, *Hook. Exot. Flor.* t. 131. Anagyris nepalensis, *Grah. in Wall. Cat.* 5340. A. indica, *Lindl. in Trans. Hort. Soc.* vii. 245.

TEMPERATE HIMALAYA, from SIMLA to BHOTAN, alt. 7–9000 ft.

A shrub 6–10 feet high; habit of the laburnum; branches downy. *Stipules* small, connate, amplexicaul; petiole 1 in. or less; leaflets glabrescent, lanceolate, 2–4 in., narrowed to both ends. *Flowers* 12–20 in subdense racemes; bracts large, deciduous; bracteoles 0. *Calyx* downy, deciduous from the base. *Corolla* yellow, above 1 in. long. *Pod* 2–5 in., 3–10-seeded.

2. THERMOPSIS, R. Br.

Perennial herbs. *Leaves* stipulate, 3-foliolate; bracts large, leafy, free. *Flowers* showy, usually yellow, racemed. *Calyx-tube* turbinate; teeth lanceolate; two upper more or less connate. *Petals* all long-clawed; standard orbicular, sides reflexed; wings obovate; keel-petals obovate-oblong, faintly joined down the back. *Stamens* free; anthers uniform. *Ovary* linear, sessile or stalked, ∞-ovulate; style filiform, incurved; stigma minute terminal. *Pod* turgid, linear or oblong, straight or falcate, continuous within.—DISTRIB. Species 12, China, Japan, N. America.

1. **T. barbata,** *Royle Ill.* 196, t. 32, fig. 1; densely shaggy, leaflets oblanceolate, corolla deep purple, pod linear-oblong. *Hook. Bot. Mag.* t. 4868. Anagyris barbata, *Grah. in Wall. Cat.* 5341.

TEMPERATE and SUBALPINE HIMALAYA, from KASHMIR and KUNAWAR to SIKKIM, ascending to 11,000 ft.

Rootstock woody. *Stems* 1 ft. or more, copiously branched dichotomously. *Leaves* sessile, subglabrescent, often opposite; stipules just like the leaflets in texture and shape. *Flowers* 6–12, short-stalked, opposite or ternate. *Calyx* shaggy, like the leaves, 3 lower teeth twice the tube. *Corolla* 1 in. long. *Pod* short-stalked, $\frac{1}{2}$–$\frac{5}{8}$ in. broad, 1–6-seeded.

2. **T. inflata,** *Camb. in Jacquem. Voy. Bot.* iv. 34, t. 39; finely downy, leaflets obovate-cuneate, corolla yellow, pod broad-oblong. *Benth. in Hook. Lond. Journ.* ii. 431.

HIMALAYAS of TIBET and KUNAWAR, alpine region, alt. 15–17,000 ft.

General habit of the last, but not more than half a foot high. *Rootstock* woody, widely creeping. *Leaves* sessile; leaflets fleshy, glaucous, $\frac{1}{2}$–$\frac{3}{4}$ in. *Stipules* like the leaflets in shape and texture. *Racemes* close, 6–10-flowered. *Flowers* short-stalked, in twos or threes. *Calyx* finely silky, the three lower teeth as long as the tube. *Pod* short-stalked, 6–10-seeded, oblong, an inch or more thick, more membranous and flexible than in *T. barbata,* and dehiscing less readily.

3. ROTHIA, Pers.

Diffuse annuals. *Leaves* petioled, digitately 3-foliolate. *Flowers* copious, minute, in the axils of the leaves. *Calyx-tube* turbinate, the teeth as long as the tube, the two upper broader and arched. *Corolla* scarcely exserted, all the petals narrow, nearly straight, distinctly unguiculate, those of the keel scarcely cohering. *Filaments* united in a tube which is slit along the top; anthers uniform, minute. *Ovary* sessile, linear, ∞-ovulate; style short, straight, filiform, stigma capitate minute. *Pod* linear, slender, nearly straight, compressed, continuous within.—DISTRIB. Two species, the other Trop. African.

1. **R. trifoliata,** *Pers; DC. Prodr.* ii. 382; *Wall. Cat.* 5821; *Wt. & Arn. Prodr.* 195; *Wight Ic.* t. 199. Lotus indicus, *Desr. in Lam. Enc.* iii. 606. Trigonella indica, *Linn.; Roxb. Fl. Ind.* iii. 389. Dillwynia trifoliata, *Roth Cat.* iii. 71. Glycine leptocarpa, *Grah. in Wall. Cat.* 5515. Hosackia indica, *Grah. in Wall. Cat.* 5940.

TROPICAL PLAINS from BUNDELKUND to CEYLON.—DISTRIB. Australia.

A copiously-branched diffuse annual with slender stems a foot or more long. *Stipules* free, minute, $\frac{1}{2}$-lunate, persistent; petioles shorter than the leaflets; leaflets oblanceolate-oblong, obtuse, minutely mucronate, rather fleshy, silky, $\frac{1}{2}$–1 in. long. *Flowers* 1–4, on short pedicels in the axils of most of the leaves. *Calyx* silky, $\frac{1}{6}$–$\frac{1}{8}$ in. *Corolla* inconspicuous, fugacious. *Pod* 1$\frac{1}{2}$–2 in., silky. *Seeds* 20 or more.

4. ARGYROLOBIUM, *Eckl. & Zeyh.*

Herbs or shrubs. *Leaves* digitately 3-foliolate; stipules free. *Flowers* yellow, in terminal or leaf-opposed racemes or umbels. *Calyx* 2-lipped, slit nearly to the base, with (in Indian species) 5 distinct teeth, 2 to the upper, 3 to the lower lip. *Corolla* scarcely if at all exserted; standard roundish; wings oblong; keel-petals broad, joined down the back to the obtuse incurved tip. *Stamens* monadelphous; anthers dimorphous. *Ovary* linear, sessile, ∞-ovuled; style elongate, filiform, curved gradually upwards inside the keel, stigma minute oblique. *Pod* linear, straight, continuous within, compressed, subtorulose.—DISTRIB. Species 40–50, mostly South African.

1. **A. flaccidum,** *Jaub. & Spach in Ann. Sc. Nat. ser.* ii. xix. 48; terminal leaflet lanceolate acute, upper lip of calyx as long as lower, 4 upper teeth deltoid, lowest subulate. *Benth. in Hook. Lond. Journ.* iii. 350. Cytisus flaccidus, *Royle Ill.* 197. Glycine? flaccida, *Wall. Cat.* 5517. A. divaricatum, *Jaub. & Spach. loc. cit.; Ill. Pl. Orient.* i. 116.

TROPICAL and TEMPERATE tracts of north-west India, ascending from the plains to 9000 ft.

A shrub with very slender diffuse branches reaching 12–18 in. high. *Stipules* minute, linear, persistent; petioles much shorter than the leaves; leaflets pale, silky, subequal, lanceolate, acute, $\frac{1}{2}$–$\frac{3}{4}$ in. long. *Flowers* 1–6 in leaf-opposed racemes on peduncles that exceed the leaves. *Calyx* $\frac{1}{6}$–$\frac{1}{4}$ in.; teeth shorter than the limb. *Pod* densely silky, 6–8-seeded, $\frac{1}{6}$ in. broad.—*Cytisus languinosus, Royle MSS.*, is a form with more densely silky vestiture.

2. **A. roseum,** *Jaub. & Spach. in Ann. Sc. Nat. ser.* ii. xix. 51; end leaflet obovate-cuneate very obtuse, upper lip of calyx shorter than lower, teeth all lanceolate. Cytisus roseus, *Camb. in Jacq. Voy. Bot.* iv. 35, t. 40. A. ornithopodioides, *Jaub. & Spach, loc. cit.*; *Ill. Pl. Orient.* i. 116. A. Kotschyi, *Boiss. Diagn.* vi. 32.

TROPICAL and SUBTEMPERATE tracts of the north-west, ascending from the plains to 7000 ft. in KUMAON.—DISTRIB. Persia.

General habit of *A. flaccidum*, but nearly or quite glabrous. *Stipules* the same: petioles as long as or shorter than the leaves; leaflets $\frac{1}{4}$–$\frac{3}{8}$ in. long, often nearly as broad, point truncate or emarginate. *Peduncles* 1–4-flowered, exceeding the leaves. *Calyx* $\frac{1}{4}$ in., glabrous; teeth of upper lip exceeding limb. *Corolla* yellow tinged with red; standard longer than upper lip of calyx. *Pod* glabrous, 10–15-seeded, $\frac{1}{12}$ in. broad.—*A. trigonelloides, J. & S.*, with a similar habit, but a shorter flatter pod with much fewer seeds, will probably be found in Scinde.

5. LOTONONIS, DC.

Herbs or shrubs with digitately trifoliolate leaves, stipules connate or free, flowers in terminal or leaf-opposed racemes or umbels. *Calyx-tube* narrow-turbinate; lowest tooth deeper than the other 4. *Corolla* little exserted; standard very narrow; wings shorter and still narrower; keel longer, suddenly incurved at the tip, its petals firmly joined along the back. *Stamens* united in a tube slit along the top; anthers dimorphous. *Ovary* sessile, linear, ∞-ovulate; style abruptly incurved at the base, stigma minute oblique. *Pod* linear, usually compressed, but in our species turgid.—DISTRIB. Species 60, nearly all restricted to South Africa.

1. **L. Leobordea,** *Benth. in Hook. Lond. Journ.* ii. 607. Leobordea lotoides, *Delile Fragm. Pl. Arab.* 23, tab. 1.

SCINDE; between the plains and Rohill pass, *Stocks*. PUNJAB; Peshawur, *Stewart*. DISTRIB. Through the desert region to Algeria, Abyssinia and the Cape.

A much-branched finely silky diffuse annual, $\frac{1}{2}$ ft. or less high. *Stipules* minute lanceolate, deciduous; petiole as long as leaf; leaflets oblanceolate, rather fleshy, obtuse, minutely mucronate, $\frac{1}{4}$–$\frac{1}{2}$ in. *Flowers* 1–5, subsessile in axils of most of the leaves. *Calyx* silky, $\frac{1}{6}$–$\frac{1}{4}$ in. *Corolla* pale yellow or red, scarcely exserted. *Pod* linear-oblong, turgid, 4–8-seeded, scarcely exserted.

6. HEYLANDIA, DC.

Calyx-tube turbinate; teeth lanceolate, three lowest deepest. *Corolla* much exserted; standard large, round; wings much smaller, obovate; keel-petals narrow, joined along the back, narrowed into an incurved beak. *Stamens* united in a tube slit above; anthers dimorphous. *Ovary* sessile, 2-ovulate; style

elongated filiform abruptly incurved at the base; stigma terminal. *Pod* oblong, flat, 1–2-seeded.—DISTRIB. A single endemic species.

1. **H. latebrosa,** *DC. Mem. Leg.* 201; *W. & A. Prodr.* 180; *Dalz. & Gibs. Bomb. Fl.* 54. Hedysarum latebrosum, *Linn. Mant.* 270. H. leiocarpa, *DC. loc. cit.*; *Wall. Cat.* 5342. Hallia hirta, *Willd. Sp. Pl.* iii. 1169. Crotalaria uniflora, *Koen. in Roxb. Fl. Ind.* iii. 271. Heylandia hebecarpa, *DC. loc. cit.* t. 34. Goniogyna hebecarpa, leiocarpa and latebrosa, *DC. in Ann. Sc. Nat. ser.* 1. iv. 91.

Everywhere in the tropical region from the GANGETIC plain and SCINDE to CEYLON.
A prostrate more or less silky much-branched herb. *Leaves* close-set, alternate, simple, subsessile, cordate-ovate, $\frac{1}{4}$–$\frac{3}{4}$ in. long, more produced in the lower half. *Flowers* in the axils of most of its leaves, subsessile, solitary. *Corolla* yellow, $\frac{1}{6}$–$\frac{1}{4}$ in. *Pod* silky, $\frac{1}{6}$–$\frac{1}{4}$ in. long.

7. PRIOTROPIS, W. & A.

Calyx-tube campanulate; teeth subequal. *Corolla* much exserted; standard roundish; wings obovate-oblong; keel broad, with a long distinct ascending beak. *Stamens* monadelphous; anthers dimorphous. *Ovary* distinctly stalked, ∞-ovulate; style long, abruptly incurved at the base, bearded on the inner side, stigma capitate. *Pod* distinctly-stalked, 5–6-seeded, oblong, flattened, continuous within.—DISTRIB. A single endemic species.

1. **P. cytisoides,** *W. & A. Prodr.* 180; *Benth. in Hook. Lond. Journ.* ii. 594; *Walp. Ann.* iv. 461. Crotalaria cytisoides, *Roxb. Fl. Ind.* iii. 276; *Wall. Cat.* 5422; *DC. Prodr.* ii. 131.

TROPICAL EAST HIMALAYA; NIPAL to AVA, *ascending to 6000 ft. in* SIKKIM.
Undershrub, with the habit of *Crotalaria striata*, with slender glabrous branches. *Stipules* 0; petioles as long as the leaves; leaflets 3, oblong, glabrous, membranous, 2–3 in. long, narrowed to both ends. *Racemes* copious, short-stalked, leaf-opposed and terminal, closely 12–20-flowered. *Calyx* $\frac{1}{8}$ in., finely silky; teeth lanceolate, as long as the tube. *Corolla* pale yellow, glabrous, 2–3 times the calyx. *Pod* 1 in. by $\frac{1}{3}$ in., narrowed to both ends; gynophore filiform, quite as long as the calyx.

8. CROTALARIA, L.

Herbs or shrubs of very various habit and vestiture. *Leaves* simple or 3-foliolate, very rarely odd-pinnate. *Flowers* in terminal or leaf-opposed racemes, often showy. *Calyx-tube* short; teeth linear or lanceolate, subequal or shortly connate in two lips. *Corolla* equalling or exceeding calyx; standard with a short claw, usually round; wings obovate-oblong, shorter; keel broad, equalling the wings, its petals joined down the back, much incurved, distinctly beaked. *Stamens* monadelphous; anthers dimorphous. *Ovary* sessile or stipitate, linear, usually multi- rarely 2-ovulate; style long, abruptly incurved at the base, bearded upwards, stigma minute oblique. *Pod* sessile or stipitate, straight, linear or oblong, turgid, continuous within, usually many-seeded.—DISTRIB. Species 2–300; spread everywhere in tropical and subtropical regions.

SECT. I. **Arenariæ,** *Benth.* Rigid copiously stiffly-branched undershrubs, often spiny, with scattered small rigid deciduous simple leaves.—A small group, characteristic of the desert Flora, reaching westward through Arabia and North Africa to Senegal.

1. **C. Burhia,** *Hamilt. in Wall. Cat.* 5386; *Benth. in Hook. Lond. Journ.* ii. 474; *Dalz. & Gibs. Bomb. Flora*, 54.

SCINDE and PUNJAB, in sandy plains, ascending to 4000 ft. CAMBAY, in the desert region, *Dalzell.*—DISTRIB. Afghanistan and Beloochistan.

A low undershrub, with very numerous stiff erecto-patent branches, clothed with fine pale tomentum. *Spines* none. *Leaves* scattered, deciduous, subsessile, oblong or lanceolate, rigid, pale green, silky, $\frac{1}{4}$–$1\frac{1}{2}$ in. long; stipules 0. *Flowers* 6–12, in elongated terminal racemes; pedicels 2-bracteolate, very short. *Calyx* densely silky, $\frac{1}{4}$–$\frac{1}{3}$ in.; teeth long, lanceolate. *Corolla* yellow, scarce exserted. *Pod* oblong, 3–4-seeded, rather longer than calyx.

SECT. II. **Diffusæ,** *Benth.* Copiously-branched herbs with flexuose trailing stems. *Leaves* close, simple. *Stipules* 0 or small, not decurrent. *Racemes* all lateral, leaf-opposed, usually reduced to few flowers or one only. *Pods* glabrous or downy.

2. **C. biflora,** *Linn.*; pod subglobose finely silky flexible 12–20-seeded. *DC. Prodr.* ii. 127; *W. & A. Prodr.* 190. Astragalus biflorus, *Linn. Mant.* 273. C. nummularia, *Willd. Sp. Pl.* iii. 979; *Roxb. Fl. Ind.* iii. 271; *DC. Prodr.* ii. 129; *Wall. Cat.* 5417 (*ex parte*). C. hirta, *Roth Nov. Sp.* 339. C. Rothiana, *DC. Prodr.* ii. 127. C. Rothii, *Spreng. Syst.* iii. 237. Cicer nummulariæfolium, *Lamk.*; *DC. Prodr.* ii. 354.

Plains of the PENINSULA and CEYLON.—DISTRIB. Java.

A silky trailing annual, with stems 1–$1\frac{1}{2}$ ft. long. *Leaves* close, subsessile, densely silky, ovate or roundish, $\frac{1}{2}$–1 in. long, obtuse, mucronate; stipules minute, usually 0. *Pedicels* 2–4 times leaves, 1 or closely 2-flowered. *Calyx* $\frac{1}{4}$ in., densely silky; teeth long, upper lanceolate, lower linear. *Corolla* yellow, scarcely exserted. *Pod* compressible, $\frac{3}{8}$–$\frac{1}{2}$ in. long, short-stalked.

3. **C. globosa,** *W. & A. Prodr.* 190; pod subglobose finely silky hard 2–4 seeded. *Benth. in Hook. Lond. Journ.* ii. 475. C. globulosa, *Wight in Wall. Cat.* 5412.

CARNATIC, Dindygul hills and Courtallum, *Wight, G. Thomson.*

Habit, vestiture, leaves, infloresence, calyx and corolla just as in *C. biflora*, but pod smaller, not compressible, glabrescent before splitting, with seeds larger and much fewer.

4. **C. filipes,** *Benth. in Hook. Lond. Journ.* ii. 475; finely silky, stipules 0, leaves cordate-oblong oblique, peduncles thread-like 1–3-flowered, bracts and corolla very minute, pod oblong glabrous 8–10-seeded. *Dalz. & Gibs. Bomb. Flora*, 56.

Plains of the west side of the WESTERN PENINSULA; DEKKAN, *Edgeworth.*

Stems very slender, $\frac{1}{2}$–1 ft., clothed with fine spreading deciduous silky hairs. *Leaves* pale, rigid, prominently veined, subsessile, obtuse, much more rounded on the lower side. *Peduncles* copious, rigid, 3–6 times the leaves, glabrous; flowers distant if more than one; bracts persistent, reflexed. *Calyx* $\frac{1}{12}$ in. long, finely silky; teeth long, all lanceolate. *Corolla* yellow, exserted; standard erect, veined, round, $\frac{1}{6}$ in. broad. *Pod* short-stalked, $\frac{1}{4}$ in. long.

5. **C. filiformis,** *Wall. Cat.* 5389; subglabrous, stipules semilunate persistent, leaves oblong, peduncles 1–2-flowered, bracts linear very minute, corolla very small, pod linear-oblong glabrous 12–16-seeded. *Benth. in Hook. Lond. Journ.* ii. 475.

AVA; Mount Prome, *Wallich.*

Stems slender, copiously branched, thinly silky when young. *Leaves* short-stalked, membranous, pale, subacute, 1–2 in. long, glaucous below; stipules small, spreading,

foliaceous. *Peduncles* very slender, sometimes pseudo-terminal by the development of leaves from their nodes; flowers if two distant. *Calyx* $\frac{1}{6}$ in. long; teeth deep, lanceolate. *Corolla* yellow, not distinctly exserted. *Pod* short-stalked, $\frac{1}{2}$–$\frac{2}{3}$ in. long.

6. **C. trichophora,** *Benth. MSS.*; densely silky, stipules 0, leaves obliquely cordate-oblong, peduncles 1–2-flowered, bracts and corolla very small, pod oblong glabrous 6–8-seeded.

CONCAN plains, *Stocks.*

Stems slender, copiously branched, 1–1½ ft., clothed with long silky yellow-brown hairs. *Leaves* sessile, membranous, ½–1 in. long, obtuse or subacute, pale, membranous, more broadly rounded on the lower side. *Peduncles* thread-like, rigid, clothed with long hairs, rarely two-flowered, often leafy downwards, longer than the leaves. *Calyx* $\frac{1}{6}$ in., densely silky; teeth long, linear. *Corolla* yellowish, scarcely exserted. *Pod* short-stalked, $\frac{1}{4}$–$\frac{1}{3}$ in. long.

7. **C. Stocksii,** *Benth. MSS.*; subglabrous, stipules deciduous very minute, leaves linear-oblong, peduncles 1-flowered, bracts and corolla very small, pod linear-oblong glabrous 12–16-seeded.

CONCAN, *Stocks*; and contained also in Helfer's Tenasserim and Andaman collection.

Stems slender, very copiously branched, 1–1½ ft. *Leaves* short-stalked, obtuse, $\frac{1}{2}$–1¼ in. long, membranous, equally narrowed on both sides at the base. *Pedicels* filiform, 2–3 times the leaves; bracts subulate. *Calyx* $\frac{1}{12}$ in.; teeth long, linear. *Corolla* yellow, slightly exserted. *Pod* sessile, $\frac{1}{4}$–$\frac{1}{3}$ in. long, finally black.

8. **C. vestita,** *Baker*; densely silky, leaves linear-oblong, stipules 0, bracts lanceolate persistent, racemes 4–5-flowered, corolla middle-sized, pod oblong glabrous 15–20-seeded.

Herb. Stocks, probably from CONCAN.

Stems slender, much branched, ½–1 ft., densely clothed with yellow-brown silky hairs. *Leaves* nearly sessile, moderately firm, equal-sided, ½–1½ in. long, base rounded, point rather obtuse. *Peduncles* spreading, exceeding leaves; bracts acute, $\frac{1}{4}$–$\frac{1}{2}$ in. long; pedicels shorter than calyx. *Calyx* ¼ in., shaggy; teeth linear, long. *Corolla* not exserted. *Pod* nearly sessile, $\frac{1}{2}$–$\frac{5}{8}$ in. long.

9. **C. prostrata,** *Roxb. Hort. Beng.* 54; *Fl. Ind.* iii. 270; finely silky, stipules 0, leaves obovate-oblong rather oblique, racemes 2–4-flowered, bracts subulate very minute, corolla small, pod linear-oblong glabrous 12–15-seeded. *Rottl. in Willd. Enum.* 747; *DC. Prodr.* ii. 130; *Wall. Cat.* 5419; *W. & A. Prodr.* 189 (*excl. syn.*); *Mart. in Munch. Denk.* 6, t. E.

Plains from the UPPER GANGES to CEYLON, ascending to 6000 ft. in the Chenab valley.—DISTRIB. Java.

Stems slender, ½–1 ft., clothed with short adpressed or spreading silky yellow-brown hairs. *Leaves* nearly sessile, $\frac{1}{2}$–1½ in. long, obtuse, pale, glaucous below, produced (cordate) on the lower side at the base. *Peduncles* finely silky, usually twice the leaves. *Calyx* $\frac{1}{12}$–$\frac{1}{6}$ in., densely silky; teeth linear, long. *Corolla* yellow, not exserted. *Pod* nearly sessile, $\frac{1}{2}$–$\frac{2}{3}$ in. long.

10. **C. humifusa,** *Grah. in Wall. Cat.* 5421; shortly silky, stipules minute subulate, leaves round-oblong, peduncles laxly 3–6-flowered, bracts and corolla very small, pod oblong glabrous 6–8-seeded. *Benth. in Hook. Lond. Journ.* ii. 476. C. prostrata, *Wight Herb. ex parte.*

KUMAON to SIKKIM and KHASIA, ascending to 5000 ft. ANAMALLAY hills, alt. 4000 ft., *Beddome.*

Stems under a foot long, slender, flexuose, much branched, densely clothed with short spreading yellow-brown silky hairs. *Leaves* nearly sessile, very obtuse, membranous, pale, glaucous below, equal at the base, ½–1 in. long. *Peduncles* arcuate, densely silky, usually 2–3 times the leaves, sometimes leafy below; pedicels cernuous, lower as long as the calyx. *Calyx* ⅛ in., densely silky; teeth linear, very long. *Corolla* yellowish, not exserted. *Pod* short-stalked, ¼ in. long.

11. **C. ferruginea,** *Grah. in Wall. Cat.* 5398; finely silky or shaggy, stipules lanceolate spreading, leaves obovate-oblong, racemes laxly 2–8-flowered, bracts small linear, corolla middle-sized, pod linear-oblong glabrous 20–30-seeded. *Benth. in Hook. Lond. Journ.* ii. 476. C. canescens, *Wall. Cat.* 5415. C. crassifolia, *Ham. in Wall. Cat.* 5416. C. obliqua, *Wall. Cat.* 5388. C. leioloba, *Bartl. Ind. Sem. Hort. Gött.* 1837; *Linnæa* xii. *Littb.* 80. C. pilosissima, *Miquel Fl. Ind. Bat.* i. 327.

NIPAL to ASSAM, ascending to 5–6000 ft.; AVA, MARTABAN, CEYLON.—DISTRIB. Java, Philippines, Formosa.

More robust than all the preceding. *Branches* in the type finely silky. *Leaves* short-stalked, moderately thick, pale beneath, obtuse, equal-sided, 1–2 in. long; stipules persistent, foliaceous, often deflexed. *Peduncles* usually 2–3 times the leaves; racemes much elongated; bracts persistent, spreading or deflexed. *Calyx* ⅜–½ in., shortly silky; teeth long, upper lanceolate, lower linear. *Corolla* not distinctly exserted. *Pod* short-stalked, 1–1¼ in. long.

VAR. β. *pilosissima, Benth. MSS.*; leaves and flowers larger, calyx and branches densely clothed with longer bright yellow-brown silky hairs.—KHASIA; 3–5000 ft., *Hook. fil. & Thomson.*

12. **C. acicularis,** *Ham. in Wall. Cat.* 5390; finely silky, stipules small lanceolate, leaves oblong oblique, racemes closely 12–20 flowered, bracts lanceolate, corolla small, pod linear-oblong glabrous 15–20 seeded. *Benth. in Hook. Lond. Journ.* ii. 476. C. disticha, *Zolling. in Flora,* 1847, 694.

BENGAL to AVA and TENASSERIM.—DISTRIB. Java, Philippines.

Stems slender, a foot long or more, thinly clothed with spreading silky hairs. *Leaves* nearly sessile, obtuse, glaucous-green, membranous, thinly silky, ½–1½ in. long, rounded on the upper, cordate on the lower side at the base; stipules persistent, reflexed. *Peduncles* equalling or exceeding leaves: *bracts* small, persistent, reflexed. *Calyx* ⅛–⅙ in., densely silky, teeth linear, very long. *Corolla* not exserted. *Pod* sessile, ¼–⅜ in. long.

13. **C. evolvuloides,** *Wight in Wall. Cat.* 5410; finely silky, stipules linear minute, leaves round-oblong obtuse slightly oblique, racemes 3–8 flowered, bracts minute lanceolate, corolla small, pod oblong finely downy 8–10-seeded. *W. & A. Prodr.* 188 (*excl. syn.*); *Benth. in Hook. Lond. Journ.* ii. 477. C. hirsuta, *Wall. Cat.* 5413 *A.C.*

Tropical region, NILGHIRIS and CEYLON.

Stems 1–2 feet long, copiously branched, clothed with fine short spreading hairs. *Leaves* short-stalked, ½–1 in. long, moderately firm in texture, always obtuse. *Peduncles* equalling or much exceeding the leaves; pedicels cernuous, exceeding the bracts, shorter than the calyx. *Calyx* ⅛ in., long densely pubescent; teeth long, linear. *Corolla* yellow, slightly exserted. *Pod* short-stalked ½–⅝ in. long.—The plant figured under this name in Wight's Icones t. 31 from Courtallum has much larger flowers and is probably a distinct undescribed species.

14. **C. hirsuta,** *Willd. Sp. Pl.* iii. 978; finely silky, stipules linear minute, leaves ovate acute slightly oblique, racemes 2–3-flowered, bracts lanceolate minute, corolla middle-sized, pod oblong finely downy 8–10-seeded. *Roxb. Fl. Ind.* ii. 270; *Wall. Cat.* 5413 *B*; *DC. Prodr.* ii. 126; *W. & A. Prodr.* 188.

C. dichotoma, *Roth Nov. Sp.* 340. C. rubiginosa, *Roxb. Fl. Ind.* iii. 269, *non Willd.* C. bifaria, *Wall. Cat.* 5399, *in part.* C. triflora, *Heyne in Wall. Cat.* 5387.

Tropical region, CENTRAL HIMALAYA, *Royle, Edgeworth, Thomson*; BUNDELCUND, *Edgeworth*; WESTERN PENINSULA, *Heyne, Wight.*

Very near the last. *Leaves* more membranous, always acute, 1–2 in. *Peduncles* shorter, more slender, often leafy, densely clothed with short spreading silky hairs. *Calyx* $\frac{1}{4}$ in., densely pubescent. *Corolla* yellow, distinctly exserted. *Pod* just the same in shape and size.

15. **C. bifaria,** *Linn. Suppl.* 322; inconspicuously pubescent, stipules linear minute, leaves round-oblong obtuse slightly oblique, racemes 1–2-flowered, bracts small lanceolate, corolla middle-sized, pod oblong finely downy 10–12-seeded. *DC. Prodr.* ii. 127; *W. & A. Prodr.* 188 (*excl. syn.*); *Wt. Ic. t.* 30; *Wall. Cat.* 5399, *ex parte*; *Dalz. & Gibs. Bomb. Fl.* 55.

Tropical regions of the WESTERN PENINSULA and CEYLON.

Habit of the two last, but pubescence short and inconspicuous. *Leaves* short-stalked, moderately firm, $\frac{1}{2}$–$1\frac{1}{2}$ in., upper casually narrow, but all obtuse. *Peduncles* stoutish, usually exceeding the leaves; bracts reflexed, persistent. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in., obscurely pubescent: teeth linear-lanceolate, long. *Corolla* yellow, slightly exserted. *Pod* short-stalked, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, very turgid, glabrescent before it splits.

16. **C. multiflora,** *Benth. in Hook. Lond. Journ.* ii. 478; shortly silky, stipules linear minute, leaves ovate acute, racemes 2–6-flowered, bracts linear, corolla large, pod oblong 10–12-seeded. *Miq. Fl. Ind. Bat.* i. 328. C. bifaria, var. multiflora, *Arn. in Nova Act. Nat. Cur.* xviii. 329.

CEYLON, alt. 3–5000 ft., *Gardner, Thwaites,* &c.

The most robust and showy species of the section. *Leaves* distinctly stalked, subcoriaceous, dark green, glandular, punctate, usually 1–2 in., but reaching in a narrow-leaved form 4–5 in. *Peduncles* $\frac{1}{4}$–$\frac{1}{2}$ foot, stout, arcuate, densely clothed like the stem with short spreading brown hairs; pedicels cernuous, $\frac{1}{2}$ in.; bracts reflexed, persistent. *Calyx* $\frac{3}{4}$–1 in., inconspicuously downy; teeth lanceolate, very long. *Corolla* yellowish, equalling the calyx; standard nearly 1 in. broad, veined with dark purple. *Pod* short-stalked, $1\frac{1}{4}$–2 in. long, densely clothed with dark brown silky hairs.

SECT. III. **Alatæ,** *Benth.* Diffuse or suberect pubescent perennials. *Leaves* simple. *Stipules* decurrent as a persistent wing to the branches. *Racemes* all lateral, leaf-opposed 1–3-flowered. *Pod* stipitate linear-oblong glabrous.

17. **C. alata,** *Hamilt. ex Roxb. in Don. Prodr.* 241; suberect, stipular wing broad, leaves thin oblong obtuse or subacute, peduncle elongated often leafy, pod long-stalked. *Roxb. Hort. Beng.* 98; *Fl. Ind.* iii. 274; *DC. Prodr.* ii. 124; *Wall. Cat.* 5356; *Benth. in Hook. Lond. Journ.* ii. 478. C. sagitticaulis, *Wall. Cat.* 5357. C. bialata, *Roxb. Fl. Ind.* iii. 274.

KUMAON to ASSAM and the KHASIA MTS. ascending to 5500 ft.; AVA, *Wallich*; MISHMI, *Griffith*; PEGU, *McLelland.*—DISTRIB. Java.

A suberect under-shrub 1–2 ft. high. *Stem* and leaves below clothed with short silky pubescence. *Leaves* subsessile, much thinner than in *C. rubiginosa*, varying from obovate to ovate-oblong, reaching 2–3 in.; stipule forming a wing from one node nearly to the next, its point lanceolate-deltoid. *Racemes* 2–3-flowered; bracts small, persistent, ovate, acuminate. *Calyx* $\frac{3}{8}$ in., densely silky; tube campanulate; bracteoles inserted above the base. *Corolla* pale, not exserted. *Pod* linear-oblong, glabrous, $1\frac{1}{4}$–$1\frac{3}{4}$ in. long, 30–40-seeded.

18. **C. rubiginosa,** *Willd. Sp. Pl.* iii. 973; diffuse, stipular wing narrow, leaves small round-obovate obtuse coriaceous, peduncle short not leafy, pod short-

stalked. *DC. Prodr.* ii. 125; *W. & A. Prodr.* 181; *Wt. Ic.* t. 885; *Benth. in Hook. Lond. Journ.* ii. 478. C. ovalifolia, *Wall. Cat.* 5411. C. Wightiana, *Wall. Cat.* 5358 *B.*

NILGHIRIS up to 4000 ft.

A spreading shrub with stems ½–1 foot long, densely shortly grey-downy. *Leaves* subsessile, rarely an inch long, dark green, always very obtuse, and densely clothed with grey or when young with yellow-brown pubescence; stipules passing suddenly into a narrow wing from the spreading deltoid points. *Racemes* sparse, 1–4-flowered. *Bracts* small, persistent, ovate; bracteoles small, lanceolate, inserted above the base. *Calyx* ⅜–½ in., densely silky. *Corolla* yellow, not exserted. *Pod* oblong, 1–1¼ in. long, glabrous, 20–30-seeded.

VAR. 1. *scabrella*; stems stronger and more ascending, flowers rather larger, pod more distinctly stalked. C. scabrella, W. & A. Prodr. 181.—NILGHIRIS and CEYLON.

VAR. 2. *Wightiana*; stems suberect much more robust than in the type, leaves thinner more silky larger reaching 2–3 in. long 1½–2 in. broad, corolla and calyx ⅝–¾ in. long, pod 1½–2 in. long, 30–40-seeded. C. Wightiana, *Grah. in Wall. Cat.* 5358, A.; *W. & A. Prodr.* 181.—NILGHIRIS and CEYLON up to 6000 ft.

SECT. IV. **Calycinæ,** *Benth.* Copiously-branched diffuse annuals or low shrubs with slender branches. *Leaves* simple, more or less hairy, stipules 0 or small not decurrent. *Racemes* all terminal or a few also lateral. *Pods* glabrous or pubescent, exserted or included.

* *Pod decidedly exserted from the calyx.*

19. **C. pusilla,** *Heyne*; *DC. Prodr.* ii. 128; annual, densely silky, stipules 0, leaves linear very small, racemes terminal and lateral laxly 3–6-flowered, bracts minute lanceolate, pod silky sessile twice the calyx. *Wall. Cat.* 5396; *W. & A. Prodr.* 189.

WESTERN PENINSULA; Bombay to Courtallum.

Stems under half a foot high, with copious ascending branches clothed with adpressed brown silky hairs. *Leaves* subsessile, firm, obtuse, ¼–¾ in. long, densely silky. *Racemes* very copious, short-stalked, ½–1 in. long. *Calyx* campanulate, silky $\frac{1}{12}$ in. deep; teeth deep, all linear. *Corolla* yellow, scarce exserted. *Pod* ⅙ in. long, thinly silky, 4–8-seeded.—The smallest of all the species.

20. **C. hirta,** *Willd.; DC. Prodr.* ii. 130; annual, finely hairy, stipules 0, leaves small linear obtuse, racemes capitate 2–4-flowered, bracts lanceolate foliaceous, pod glabrous sessile twice calyx. *Mart. in Munch. Denks.* 6 t. *F.*; *W. & A. Prodr.* 182; *Benth. in Hook. Lond. Journ.* ii. 567. C. chinensis, *Roxb. Fl. Ind.* iii. 268; *Wall. Cat.* 5385, *non Linn.* C. pilosa, *Roxb. in E. I. C. Mus.* t. 370; *Rottl. Nova Act.* 1808.

DEKKAN, near Hydrabad.

A diffuse annual with slender branches, thinly clothed with short spreading hairs. *Leaves* short-stalked ¼–¾ in., moderately close, rounded at the base. *Flowers* crowded at the end of leafy branches; pedicels very short. *Calyx* ¼ in., densely silky; teeth long, all linear, acuminate. *Corolla* scarce exserted. *Pod* oblong, 15–20-seeded. —Differs from *chinensis* by its small obtuse leaves and much shorter calyx.

21. **C. mysorensis,** *Roth; DC. Prodr.* ii. 126; annual, densely silky, stipules linear persistent, leaves linear-oblong obtuse, racemes terminal and lateral laxly 6–9-flowered, bracts lanceolate foliaceous, pod subsessile glabrous twice the calyx. *Wall. Cat.* 5361; *W. & A. Prodr.* 182. C. stipulacea, *Roxb. Fl. Ind.* iii. 264. C. hirsuta, *Roxb. in E. I. C. Mus.*, t. 1595.

TROPICAL REGION, all through India proper, ascending to 4000 ft. in KUMAON.

Copiously branched, 1–2 ft. high, the stems clothed with long dense erecto-patent brown silky hairs. *Leaves* membranous, short-stalked, 1–3 in. long, rounded at both ends, thinly silky. *Racemes* stalked, reaching 6–9 in. long. *Calyx* $\frac{1}{2}$–$\frac{5}{8}$ in. deep, densely clothed with long silky hairs; teeth all long, acuminate, upper lanceolate, lower linear. *Corolla* yellow, not exserted. *Pod* oblong, 1–1$\frac{1}{4}$ in. long, 20–30-seeded.

22. **C. triquetra,** *Dalzell in Hook. Kew Journ.* ii. 34; suffruticose, branches triquetrous obscurely pubescent, stipules lanceolate minute, leaves lanceolate-oblong obtuse, racemes lateral and terminal laxly 2–3-flowered, pod silky short-stalked 3–4 times the calyx. *Dalz. & Gibs. Bomb. Flora,* 56.

WESTERN PENINSULA; CONCAN and MALWAN, *Dalzell, Stocks, Law*; CEYLON, *Thwaites.*

Suffruticose, 1–2 ft. high with copious very slender ascending branches angled down to the base. *Leaves* membranous, pale green, glabrescent, 1–2 in. long, broadly rounded at the base. *Racemes* long-stalked, very lax; bracts minute, lanceolate. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in. deep, thinly silky; teeth long all linear, acuminate. *Corolla* pale yellow, $\frac{1}{2}$ in. long; standard ovate, pointed. *Pod* oblong-cylindrical, $\frac{3}{4}$ in. long, thinly coated with short yellow-brown silky hairs, 15–20-seeded.

23. **C. albida,** *Heyne; DC. Prodr.* ii. 126; suffruticose, branches terete minutely silky, stipules 0, leaves linear or oblanceolate obtuse, racemes mostly terminal laxly 6–20-flowered, bracts linear very minute, pods glabrous sessile 1$\frac{1}{2}$ or twice the calyx. *W. & A. Prodr.* 189. C. montana, *Roxb. Fl. Ind.* iii. 265; *W. & A. Prodr.* 182. C. scoparia, *Wall. Cat.* 5418. C. parva, *Grah. in Wall. Cat.* 5402. C. punctata, *Grah. in Wall. Cat.* 5401 *A. & C.* C. tenuis, *Wall. Cat.* 5403.

TROPICAL REGION through India proper and CEYLON, ascending to 5500 ft. in KUMAON, and to 6–7000 in the WEST HIMALAYAS. BIRMA, *Wallich.* PEGU, *McClelland.* TENASSERIM, *Helfer.*—DISTRIB. Malay Isles, China, and Philippines.

A shrub 1–2 ft. high, with very numerous firm slender, obscurely silky branches. *Leaves* short-stalked, firm, 1–2 in., thinly silky beneath, pellucido-punctate, glabrescent above. *Racemes* 2–4 in. long, rarely lateral. *Calyx* turbinate, $\frac{1}{4}$ in., finally $\frac{1}{3}$ in. long, thinly silky; teeth long, 3 lower linear acuminate, upper broader often subobtuse. *Corolla* pale yellow, glabrous, scarcely exserted. *Pod* oblong-cylindrical, $\frac{1}{2}$–$\frac{2}{3}$ in. long, 6–12-seeded.

VAR. 1. *epunctata*; leaves membranous pubescent not dotted, racemes very lax 3–6-flowered, calyx teeth all linear acuminate. C. epunctata, *Dalz. in Kew Journ.* iii. 210; *Dalz. & Gibs. Bomb. Flora,* 56.—SOUTHERN CONCAN, *Dalzell.*

** *Pod included or very slightly exserted.*

24. **C. nana,** *Burm. Fl. Ind.* 156, t. 48, fig. 2; leaves oblanceolate obtuse, racemes capitate 6–12-flowered, calyx densely silky, upper teeth connate, pod ovoid small glabrous sessile slightly exserted. *DC. Prodr.* ii. 127; *W. & A. Prodr.* 191; *Dalz. & Gibs. Bomb. Fl.* 56. C. umbellata, *Wight in Wall. Cat.* 5383; *W. & A. Prodr.* 191; *Dalz. & Gibs. Bomb. Fl.* 56. C. biflora, *Herb. Madr. in Wall. Cat.* 5381, *not of Linn.* C. sobolifera, *Grah. in Wall. Cat.* 5420 B.

WESTERN PENINSULA and CEYLON, ascending to 6000 ft.

An annual 1 ft. or less high, with copious slender terete ascending or spreading branches clothed with short silky hairs. *Leaves* $\frac{1}{2}$–1 in., moderately firm, thinly silky above, densely so below, base subcuneate, stipules 0. *Bracts* and bracteoles minute, subulate; upper flowers often quasi-umbellate. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in. long, densely clothed with long silky hairs; teeth of lower lip narrow, acuminate. *Corolla* pale, not exserted. *Pod* 6–8-seeded, black when mature.

VAR. 1. *patula*; leaves narrow linear, calyx more shortly silky. C. patula, *Grah. in Wall. Cat.* 5371.—BIRMA, *Wallich, Griffith.*

25. **C. linifolia,** *Linn. fil.*; *DC. Prodr.* ii. 128; leaves oblanceolate obtuse rarely linear, racemes elongated laxly 6–20-flowered, calyx shortly silky, upper teeth connate, pod small ovoid-oblong sessile glabrous as long as calyx. *Roxb. Fl. Ind.* ii. 266; *Don Prodr.* 241; *Wall. Cat.* 5400 *in part*; *W. & A. Prodr.* 190 (*excl. syn.*); *Dalz. & Gibs. Bomb. Fl.* 56. C. cæspitosa, *Roxb. Fl. Ind.* iii. 269. C. montana, *Heyne in Roth Nov. Sp.* 335; *DC. Prodr.* ii. 126, *not of Roxb.* C. sobolifera, *Grah. in Wall. Cat.* 5420 A. C. stenophylla, *Vogel in Nova Acta Nat. Cur.* xix. *Suppl.* 7. C. saxatilis, *Zolling. in Flora*, 1847, 694. C. melanocarpa, *Wall. Cat.* 5382.

TROPICAL REGION: SIKKIM, alt. 1–4000 ft. WESTERN PENINSULA, CEYLON, BIRMA, PEGU.—DISTRIB. Malay Isles, China, Philippines, N. Australia.

Annual, ½–2 ft. high, with copious slender firm terete branches clothed with short adpressed silky hairs. *Leaves* short-stalked, moderately firm, shortly silky, base subcuneate; stipules 0. *Racemes* usually terminal only, reaching ½–1 ft. long; bracts and bracteoles subulate, very minute. *Calyx* ⅙–¼ in. long, deeply bilabiate, densely shortly brown-silky; teeth of upper lip very short, of lower deep linear. *Corolla* pale yellow, glabrous, scarcely exserted. *Pod* 8–10-seeded, black when mature.

26. **C. tecta,** *Roth*; *DC. Prodr.* ii. 126; suffruticose, thinly shortly silky, leaves obtuse obovate-oblong, racemes lax terminal only, calyx middle-sized, upper teeth subconnate, pod oblong as long as calyx. *Benth. in Hook. Lond. Journ.* ii. 569. C. viminea, *Wall. Cat.* 5397; *W. & A. Prodr.* 189. C. linifolia var. *Wall. Cat.* 5400 B. C. punctata var. *Wall. Cat.* 5401 B.

WESTERN PENINSULA, in the CONCAN, NILGHIRIES, PULNEY MTS.

A low *undershrub* with numerous stiff terete erecto-patent branches, clothed with short grey silky hairs. *Leaves* firm, ½–1½ in., cuneate in lower half, retuse or emarginate at apex, glabrescent above, thinly silky below; stipules 0. *Racemes* 6–12-flowered, ¼–½ ft. long, usually distinctly stalked; bracts and bracteoles linear, very minute. *Calyx* ⅜–½ in. long, shortly velvety, lower teeth linear. *Corolla* pale yellow, glabrous, equalling the calyx. *Pod* sessile, glabrous, 9–12-seeded.

27. **C. occulta,** *Grah. in Wall. Cat.* 5360; suffruticose, shortly silky, leaves oblanceolate-oblong usually acute, flowers in lax terminal racemes and often solitary from leafy nodes, calyx middle-sized shortly silky, teeth all long, upper broad rather obtuse, pod oblong included. *Benth. in Hook. Lond. Journ.* ii. 565. C. rhizophylla, *Grah. in Wall. Cat.* 5431.

KHASIA MTS. and SILHET, alt. 3–5000 ft.

Stems 2–3 ft. high, annual ?, simple or with few or many virgate ascending branches clothed with short adpressed silky hairs. *Leaves* firm, 2–3 in., subcuneate at base, glabrous above, glaucous and obscurely silky beneath; stipules setaceous very minute. Terminal *racemes* 6–20-flowered, ¼–½ ft. long; bracts linear, minute. *Calyx* ½–⅝ in. deep, densely clothed with short brown silky hairs; upper teeth oblong-spathulate, ¼–⅓ in. broad. *Corolla* glabrous, deep violet-blue, as long as the calyx. *Pod* glabrous, sessile, 10–15-seeded.

28. **C. calycina,** *Schrank*; *DC. Prodr.* ii. 129; annual, shortly silky, leaves linear or lanceolate acute or rather obtuse, flowers few in lax racemes and solitary from leafy nodes, calyx large densely clothed with long silky hairs, teeth all long, upper broad rather obtuse, pod linear-oblong included. C. stricta, *Roxb. Fl. Ind.* iii. 265 *not of Roth.* C. Roxburghiana, *DC. Prodr.* ii. 129. C. anthylloides, *Don Prodr.* 241; *Wall. Cat.* 5366 A. *ex parte*; *W. & A. Prodr.* 181; *Dalz. & Gibs. Bomb. Fl.* 54, *not of Lam.* C. linearis, *Herb. Madr. in Wall. Cat.* 5370. C. crinita, *Grah. in Wall. Cat.* 5408. C. salicifolia var. ? *Wall. Cat.* 5359 B.

TROPICAL REGION, from the HIMALAYAS to CEYLON, ascending to 5,500 ft. in KUMAON.—DISTRIB. Tropical Africa, Malay Isles, China, N. Australia.

Stems 1–2 ft. high, simple or with a few slender ascending branches clothed with short adpressed silky hairs. *Leaves* moderately firm, usually 2–4 in., but in the linear form 5–6 in., usually acute, glabrous above, obscurely silky beneath; stipules subulate, very minute, deciduous. Terminal *racemes* 2–12-flowered, rarely reaching ½ ft. long; bracts and bracteoles large, lanceolate. *Calyx* ¾–1 in. long, persistently densely clothed with long brown silky hairs; lower teeth lanceolate-acuminate, upper oblanceolate, ⅜–½ in. broad. *Corolla* glabrous, pale yellow, shorter than the calyx. *Pod* sessile, glabrous, ½–¾ in. long, 20–30-seeded.

29. **C. sessiliflora,** *Linn.*; *DC. Prodr.* ii. 129; annual, shortly silky, leaves linear acute rarely lanceolate, flowers in elongated racemes rarely solitary from leafy nodes, calyx middle-sized densely clothed with long silky hairs, teeth all long, upper lanceolate acute, pod oblong as long as the calyx. *Benth. in Hook. Lond. Journ.* ii. 565. C. anthylloides, *Lam.*; *Wall. Cat.* 5366 A. *in part,* B. C. C. venusta, *Wall. Cat.* 5365. C. nepalensis, *Link Enum.* ii. 228. C. brevipes, *Champ. in Hook. Kew Journ.* iv. 44. C. eriantha, *Sieb. & Zucc. Fl. Jap.* 13. C. Oldhami, *Miq. Ann. Mus. Lug. Bat.* iii. 42.

UPPER PUNJAB and along the base of the Himalayas to ASSAM, ascending to 5,500 ft. in KUMAON; BIRMA, *Wallich*; PEGU, *McLelland.*—DISTRIB. China, Philippines, Japan.

Stems 1–2 ft. high, simple or furnished with few or many ascending branches. *Leaves* moderately firm, narrowed to both ends, 2–6 in., glabrous above, thinly silky below; stipules setaceous, very minute. *Flowers* deflexed, 2–20 to a raceme, close; racemes reaching 6–9 in. long; bracts and bracteoles long, setaceous, persistent. *Calyx* ⅜–½ in. long, brown silky hairs long and dense, but not as much so as in *calycina*; teeth all acute, upper ⅛ in. broad. *Corolla* blue-white, glabrous, not exserted. *Pod* glabrous, sessile, 10–15-seeded.

30. **C. chinensis,** *Linn.*; *DC. Prodr.* ii. 130; annual, laxly silky, leaves linear or oblanceolate obtuse or subacute, flowers 3–6 densely capitate all terminal, calyx middle-sized, teeth long upper lanceolate, pod oblong as long as calyx. *Benth. in Hook. Lond. Journ.* ii. 566 (*not of Roxb.*)

UPPER GANGETIC PLAIN, CONCAN, MALABAR, PEGU, and TENASSERIM.—DISTRIB. Sumatra, Philippines, China.

Stems 1–2 ft. high, usually with several stout ascending branches densely clothed with long brown silky hairs. *Leaves* moderately firm, sparsely silky, 1–2 in., pale below, base rather rounded; stipules 0. *Calyx* ⅜–½ in., densely laxly silky; lower teeth linear; bracts and bracteoles linear, persistent. *Corolla* glabrous, not exserted. *Pod* sessile, glabrous, 15–20-seeded.

31. **C. speciosa,** *Heyne*; *DC. Prodr.* ii. 129; shrubby, densely silky, leaves linear-oblong obtuse, flowers 6–12 densely capitate all terminal, calyx middle-sized, teeth all long narrow acuminate, pod oblong included. *Benth. in Hook. Lond. Journ.* ii. 564. C. cephalotes, *Herb. Madr. in Wall. Cat.* 5373.

MYSORE, *Heyne.*

Stems quite woody, with rigid erecto-patent branches, densely clothed with short bright brown silky hairs. *Leaves* firm, 1–1½ in., densely silky on both sides, rounded at both ends; stipules subulate, very minute. *Heads* copious, round, terminal, usually with a leaf just beneath; bracts lanceolate, as long as calyx, persistent velvety. *Calyx* ½ in. long, densely persistently velvety. *Corolla* as long as calyx, densely silky on the outside. *Pod* sessile, glabrous, 10–12-seeded, much shorter than the calyx.

32. **C. dubia,** *Grah. in Wall. Cat.* 5404; annual, shortly silky, leaves obovate cuneate subacute, flowers 12–30 in dense terminal heads, calyx small densely silky, teeth all long acuminate, pod oblong as long as calyx. *Benth. in Hook. Lond. Journ.* ii. 568.

WESTERN PENINSULA, *Stocks, Beddome.* CHITTAGONG, *Hook. fil. & Thomson.* TENASSERIM, *Griffith.*

Stems 1–2 ft. high, simple or with many subpatent or arcuate-ascending branches. *Leaves* membranous, 2–3 inches, cuneate in lower third, thinly silky above, pale and densely silky beneath; stipules minute, setaceous. *Heads* round or oblong, mostly with a leaf just beneath; bracts and bracteoles large, persistent, ovate-acuminate. *Calyx* ¼ in. deep; pubescence long, pale brown, silky, very dense; teeth linear or lanceolate. *Corolla* glabrous, as long as calyx. *Pod* sessile, glabrous, 6–8-seeded.

29054 33. **C. capitata,** *Benth. MSS.*; shrubby, finely silky, leaves oblanceolate subacute, flowers 6–20 in dense terminal heads, calyx middle-sized, teeth all long, upper broad subacute, pod oblong included.

KHASIA MTS., 5–7000 ft, *Hook. fil. and Thomson, Lobb, Simons.*

Branches cæspitose from a perennial rootstock, 1–1½ ft. long, slender, suberect, mostly simple, clothed with short silky pubescence. *Leaves* firm, cuneate in the lower half, 1–1½ in., green, glabrous above, densely shortly silky below; stipules 0. *Heads* round or oblong, 1–2 in. long; bracts and bracteoles small, linear, persistent. *Calyx* ½ in. deep; the vestiture and shape of teeth as in *C. sessiliflora.* *Corolla* deep violet-blue, glabrous, as long as the calyx. *Pod* sessile, glabrous, not seen mature.

34. **C. priestleyoides,** *Benth. MSS.*; shrubby, laxly silky, leaves oblanceolate-oblong subacute, flowers few in dense terminal heads, calyx middle-sized shaggy, teeth all long, upper lanceolate acute, pod oblong included.

CONCAN, *Law, Stocks*; ANAMALLAYS, *Beddome.*

A low undershrub with long ascending branches, densely clothed with moderately long brown silky hairs. *Leaves* firm, subsessile, ½–1 in., glabrescent above, thinly shaggy beneath, base rather rounded; stipules 0. *Heads* 4–8-flowered; bracts lanceolate, acuminate, persistent as the calyx. *Calyx* ½–⅝ in. long, as densely shaggy as in *C. calycina*; upper teeth ⅛–⅙ in. broad, lower linear. *Corolla* glabrous, as long as the calyx. *Pod* sessile, glabrous, 10–15-seeded.

SECT. V. **Glaucæ,** *Benth.* Erect herbs or shrubs, glabrous throughout. *Stipules* 0 or very minute deciduous. *Racemes* terminal.

35. **C. lutescens,** *Dalz. in Hook. Kew Journ.* ii. 34; herbaceous, bracts linear very minute, calyx-teeth linear. C. peduncularis, *Dalz. & Gibs. Bomb. Flor.* 55, *not of Grah.*

CONCAN, plains, *Law, Dalzell.*

Stems erect, slender 1–3 ft. high. *Leaves* membranous, pale, nearly sessile, varying from oblong obtuse to linear acute, reaching 4–6 in. *Raceme* laxly 6–15-flowered; pedicels cernuous finally ½–¾ in. long. *Calyx* ½ in.; tube very short. *Corolla* yellow, twice the calyx; standard ovate, conspicuously veined. *Pod* 1–1½ in. long; gynophore finally equalling calyx.

36. **C. neriifolia,** *Wall. Cat.* 5362; shrubby, bracts linear very minute, calyx-teeth lanceolate. *Benth. in Hook. Lond. Journ.* ii. 560.

AVA; mount Taong Dong, *Wallich.*

A shrub with slender terete branches. *Leaves* membranous, pale, nearly sessile, lanceolate, rather rounded at the base, subobtuse, 3–4 in. *Racemes* laxly 12–20-flowered, reaching half a foot long; pedicels slender, as long as calyx. *Calyx* ½ in. long; tube campanulate. *Corolla* nearly twice the calyx; standard orbicular, obtuse. *Ovary* linear, silky. *Pod* unknown.

37. **C. peduncularis,** *Grah. in Wall. Cat.* 5369; bracts large ovate acuminate persistent, calyx-teeth lanceolate. *W. & A. Prodr.* 186; *Benth. in Hook. Lond. Journ.* ii. 480. C. elegans, *Bedd. in Madr. Journ.* iii. 178; *Ic. Pl. Ind. Or.* t. 106.

NILGHIRIS, at about 4000 ft. elevation, *Wight, Beddome.*

General habit of *C. peduncularis.* *Leaves* narrow-linear, short-stalked, reaching 5–6 in. *Raceme* laxly 12–20-flowered, finally a foot long; lower pedicels ¾–1 in. long; bracts reflexed, shorter than the pedicels. *Calyx* ⅜ in.; teeth one-third the tube. *Corolla* smaller than in the last; standard the same shape and colour. *Pod* 1½–2 in. long; gynophore finally exceeding the calyx.

SECT. VI. **Erectæ,** *Benth.* Erect herbs or shrubs, the foliage more or less silky or pubescent. *Stipules* 0, or small, not decurrent. *Racemes* rarely other than terminal. *Pods* glabrous, several times longer than the calyx.

38. **C. retusa,** *Linn.*; *DC. Prodr.* ii. 125; branches and calyx subglabrous, stipules subulate very minute, leaves obtuse glabrous above puberulent below, bracts subulate, corolla much exserted. *Roxb. Fl. Ind.* iii. 272; *Bot. Mag.* t. 2561; *Bot. Reg.* t. 253; *Wall. Cat.* 5405; *W. & A. Prodr.* 187; *Dalz. & Gibs. Bomb. Fl.* 55. Lupinus cochinchinensis, *Lour.*; *DC. Prodr.* ii. 410—*Rheede. Mal.* ix. t. 25.

Tropical region; HIMALAYAS to CEYLON and MALACCA, but often cultivated. DISTRIB. China, Malaya, N. Australia, Trop. Africa and America, in both the last doubtfully wild.

A robust undershrub 3–4 ft. high, with stout striated branches. *Leaves* short stalked, oblanceolate-oblong, moderately firm, cuneate at the base, 1½–3 in. *Racemes* laxly 12–20-flowered; pedicels shorter than calyx. *Calyx* ⅜–½ in.; teeth lanceolate, twice campanulate tube. *Corolla* nearly twice calyx, yellow tinged with purple. *Pod* linear-oblong, 1–1½ in. long, distinctly stalked, 15–20-seeded.

39. **C. sericea,** *Retz.*; *DC. Prodr.* ii. 126; branches and calyx subglabrous, stipules leafy persistent, leaves subacute or obtuse glabrous above finely silky beneath, bracts ovate foliaceous, corolla much exserted. *W. & A. Prodr.* 186; *Wall. Cat.* 5406; *Roxb. Fl. Ind.* iii. 273, *not of Burm.*; *Dalz. & Gibs. Bomb. Fl.* 55. C. spectabilis, *Roth.*; *DC. Prodr.* ii. 125. C. macrophylla, *Weinm. Syll.* ii. 26. C. cuneifolia, *Schrank Syll.* ii. 78.

Tropical region; through India proper, ascending to 3000 ft. in KUMAON. MALACCA, *Griffith.* PEGU, *McClelland.*

Habit and branches of *C. retusa.* *Leaves* oblanceolate-oblong, moderately firm in texture, 3–6 in., cuneate at the base. *Racemes* laxer, 20–40-flowered, often a foot long; bracts persistent, reflexed; pedicels exceeding calyx. *Calyx* ½ in.; teeth lanceolate, twice campanulate tube. *Corolla* half as long again as calyx, generally purplish. *Pod* 1–2 in. long, distinctly stalked, ¾–⅞ in. broad.

40. **C. assamica,** *Benth. in Hook. Lond. Journ.* ii. 481; branches and calyx silky, stipules minute subulate, leaves acute glabrous above finely silky below, bracts linear-lanceolate minute, corolla much exserted. C. Burmanni, *DC. Prodr.* ii. 126? C. sericea, *Burm. Fl. Ind.* t. 48, fig. 1?

KHASIA MTS., alt. 3–4000 ft., *Hook. fil. & Thomson, Lobb*; ASSAM, *Mrs. Mack.*—DISTRIB. Philippines, *Cuming*, 1886.

General habit just that of the two preceding, to which it is allied closely. *Leaves* oblanceolate-oblong, short-stalked, moderately firm, 2–4 in. long, cuneate at the base. *Racemes* laxly 20–30-flowered reaching a foot long; lower pedicels equalling calyx. *Calyx* ½–⅝ in.; teeth lanceolate, twice campanulate tube. *Corolla* ¾ in. deep, golden-yellow. *Pod* 1½–2 in. long, distinctly stalked.

41. **C. Kurzii,** *Baker*; branches and calyx silky, stipules minute subulate, leaves acute glabrous above finely silky below, bracts linear-lanceolate minute, corolla not exserted. *Kurz in Journ. Asiat. Soc. Beng.* vol. xlii. pt. 2, p. 229.

PEGU, *Kurz*, No. 1664.

Closely allied to *C. assamica*, from which it differs mainly in calyx and corolla, the

former being the same size, but cleft more deeply, with narrower teeth and the latter much smaller. *Leaves* rather more coriaceous, 3–4 in., narrowed from the middle to both ends, the adpressed brown pubescence of the underside coarser and less silky. *Pod* oblong, glabrous, distinctly stalked.

42. **C. Leschenaultii,** *DC. Prodr.* ii. 125; branches and calyx subglabrous, stipules minute lanceolate, leaves obtuse glabrous above densely grey-silky below, bracts ovate persistent, corolla much exserted. *W. & A. Prodr.* 186; *Benth. in Hook. Lond. Journ.* ii. 481; *Grah. Cat. Bomb. Pl.* 44; *Dalz. & Gibs. Bomb. Fl.* 54. C. lupiniflora, *Grah. in Wall. Cat.* 5407.

NILGHIRIS and highest Ghauts of CONCAN.

General habit of the three preceding, to which it is closely allied. *Leaves* oblanceolate-oblong, subcoriaceous, 3–4 in., cuneate at the base, clothed beneath with thick white silky pubescence. *Racemes* rather densely 20–30-flowered, reaching ½ ft. long; bracts like those of *C. sericea* but smaller; lower pedicels as long as the calyx. *Calyx* ½ in.; teeth lanceolate, twice campanulate tube. *Corolla* yellow, ¾ in. deep. *Pod* distinctly stalked, linear-oblong, 1½ in. long.—A specimen from Ram Ghaut, *Ritchie*, perhaps distinct, has subulate bracts and leaves finely silky beneath.

43. **C. formosa,** *Grah. in Wall. Cat.* 5393; branches and calyx densely silky, stipules lanceolate minute, leaves obtuse glabrous above densely silky beneath, bracts linear silky persistent, corolla not exserted. *W. & A. Prodr.* 186; *Wt. Ic.* t. 981; *Benth. in Hook. Lond. Journ.* ii. 481.

NILGHIRIS.

Dwarfer and more branched than the four preceding, with woody stems densely clothed with grey or yellow-brown silky hairs. *Leaves* oblanceolate-oblong, 2–3 in. moderately firm, short-stalked, cuneate at the base. *Racemes* very dense, 1–2 in., long; pedicels $\frac{1}{12}$–$\frac{1}{6}$ in., densely silky. *Calyx* shaggy, ¼–⅜ in.; teeth deep, lanceolate-deltoid. *Pod* oblong, 1¼–1½ in. long, distinctly stalked.

44. **C. barbata,** *Grah. in Wall. Cat.* 5394; shrubby, stipules 0, leaves oblanceolate-oblong subacute thinly silky above densely silky beneath, racemes simple 6–12-flowered, bracts minute lanceolate, pedicels as long as calyx, pod stalked. *W. & A. Prodr.* 181; *Wt. Ic.* t. 980; *Benth. in Hook. Lond. Journ.* ii. 483.

NILGHIRIS; Travancor, ascending to 6000 feet, *Beddome.*

Sparingly branched. *Branches* woody, clothed with ascending dark brown silky hairs. *Leaves* like those of *C. sericea* in shape and size, moderately firm, short-stalked, cuneate at the base. *Racemes* finally half a foot long; pedicels ½–¾ in., densely silky, not bracteolate at the middle. *Calyx* ¾ in., deeply bilabiate, densely shaggy with dark brown silky hairs; teeth of lower lip linear, equalling limb. *Corolla* scarce exserted. *Pod* 1½ in. long by half as broad, 15–20-seeded.

45. **C. longipes,** *W. & A. Prodr.* i. 183; shrubby, stipules 0, leaves obovate-oblong rather obtuse both sides minutely silky, racemes copiously panicled, bracts foliaceous ovate, pedicels as long as calyx, pod stalked. *Benth. in Hook. Lond. Journ.* ii. 483.

NILGHIRIS.

A stiff undershrub with a straight woody stem, copiously paniculately branched. *Branches* densely clothed with short ferruginous silky hairs. *Leaves* coriaceous, short-stalked, more or less rounded at base, vestiture thin and shining, lower 3–4 in. *Flowers* 3–4, close together near the top of numerous rigid branches; bracts copious, reflexed, foliaceous. *Calyx* ½ in., densely clothed with brown silky hairs, deeply bilabiate; lower teeth reaching half way down. *Corolla* ¾–⅞ in.; standard silky on the back. *Pod* linear-oblong, 1–1¼ in. long, 10–12-seeded, narrowed into a long gynophore.—Except for the glabrous pod, its affinity is with *C. madurensis.*

46. **C. peguana,** *Benth. MSS.*; shrubby, stipules 0, leaves oblong-lanceolate both sides obscurely silky, racemes prolonged into the axils of numerous leaves, bracts subulate very minute, pod sessile.

PEGU; near Rangoon, *McClelland.*
Branches slender, terete, finely puberulent or glabrescent. *Leaves* nearly sessile, 1–4 in., narrowed to both ends, firm and thinly silky on both sides in exposure, but membranous and glabrous above in a shade form; lower pedicels as long as the calyx. *Flowers* beside the lax terminal racemes springing solitary or in pairs from many of the leaf-bearing nodes. *Calyx* $\frac{3}{8}$ in.; teeth long, linear-lanceolate. *Corolla* scarcely exserted. *Pod* cylindrical, $\frac{3}{4}$ in. long, 10–12-seeded.

47. **C. salicifolia,** *Heyne in Wall. Cat.* 5359 A.; herbaceous, stipules 0, leaves oblong or lanceolate acute both sides shortly silky, racemes long-stalked simple few-flowered, bracts minute lanceolate, pedicels as long as calyx, pod stalked. *W. & A. Prodr.* 182; *Benth. in Hook. Lond. Journ.* ii. 482.

WESTERN PENINSULA, *Heyne.*
Stem stiff, sparingly branched, densely clothed with short ascending ferruginous silky hairs. *Leaves* ceasing a space below the inflorescence, lower oblong or oblanceolate-oblong, upper linear-lanceolate reaching 3–4 in., both sides clothed with hairs like those of the stem. *Flowers* near the end of long branches. *Calyx* $\frac{3}{4}$ in. deep, densely coated with bright brown velvety hairs; teeth linear, all very long. *Corolla* bright yellow, not exserted. *Pod* $1\frac{1}{2}$–2 in. long, half as broad.

48. **C. lanata,** *Bedd. in Madr. Journ.* iii. 178; *Ic. Pl. Ind. Or.* t. 105; shrubby, stipules foliaceous $\frac{1}{2}$-lunate, leaves large oblong, racemes not panicled, bracts minute lanceolate, pedicels short, pod stalked.

WESTERN PENINSULA; Anamallay and Pulney Mts., alt. 3–4000 ft., *Beddome.*
A shrub 12–15 feet high, with the habit, stipules and inflorescence of *C. semperflorens.* *Branches* stout, densely clothed with short brown pubescence. *Leaves* distinctly stalked, membranous, very large, green and glabrous above, thinly matted beneath. *Calyx* $\frac{1}{2}$–$\frac{5}{8}$ in. long, densely silky; teeth linear-lanceolate, twice the tube. *Corolla* yellow, much exserted. *Pod* 'glabrous' (Beddome) oblong, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long.

SECT. VII. **Eriocarpæ,** *Benth.* Erect shrubs, the foliage more or less silky or pubescent. *Leaves* simple, stipules not decurrent. *Racemes* terminal only or both terminal and lateral, in one group copiously panicled. *Pods* silky or velvety, many or few-seeded exserted or included.

**Flowers racemed.*

49. **C. verrucosa,** *Linn.*; *DC. Prodr.* ii. 125; branches acutely angled, stipules foliaceous $\frac{1}{2}$-lunate, leaves ovate the base deltoid usually obtuse, racemes lateral and terminal not panicled, pod stalked obscurely downy 4–6 times the calyx. *Bot. Mag.* t. 3034; *W. & A. Prodr.* 187; *Wt. Ic.* t. 200; *Dalz. & Gibs. Bomb. Fl.* 55. C. angulosa, *Lamk.*; *Roxb. Fl. Ind.* iii. 273. C. cœrulea, *Jacq. Ic.* t. 144. C. acuminata, *G. Don. Gard. Dict.* ii. 134.—*Rheede Hort. Mal.* ix. t. 29.

TROPICAL REGION; HIMALAYAS to CEYLON (reaching 2000 ft. in SIKKIM); BIRMA, *Wallich*; PEGU, *McClelland*; MALACCA, *Griffith.*—DISTRIB. China, Malaya, Trop. Africa, Mauritius, Trop. America.
Copiously branched, scarcely shrubby, 2–3 feet high. *Branches* at first puberulent, soon glabrescent. *Leaves* thin, obscurely downy beneath, reaching 4–6 in., casually acute. *Racemes* moderately close, 12–20-flowered, $\frac{1}{2}$ foot or more long; bracts linear, very minute; pedicels equalling or shorter than calyx. *Calyx* $\frac{1}{4}$ in., obscurely

downy; teeth lanceolate, twice tube. *Corolla* twice calyx, yellow, white and blue. *Pod* finely pubescent, 1–1½ in. long, 10–12-seeded.

50. **C. semperflorens,** *Vent.*; *DC. Prodr.* ii. 125; branches terete, stipules foliaceous ½-lunate, leaves oblong rounded at base acute or obtuse, racemes lateral and terminal not panicled, pod stalked obscurely downy 4–5 times the calyx. *Wall. Cat.* 5391. C. Wallichiana, *W. & A. Prodr.* 187; *Wt. Ic.* t. 982. C. Arnottiana, *Benth. in Hook. Lond. Journ.* ii. 560.

Tropical region; Nilghiris.—Distrib. Java.

More shrubby than *C. verrucosa.* *Branches* sulcate and puberulent when young, soon glabrescent and terete. *Leaves* 2–4 in., moderately firm, green and glabrous above, pale and shortly downy below, distinctly petiolate. *Inflorescence* like that of *C. verrucosa*; bracts minute, subulate; pedicels ¼–⅓ in., finely downy. *Calyx* ⅜–½ in., more or less densely puberulent; teeth linear, twice the campanulate tube. *Corolla* ½–¾ in., bright yellow. *Pod* 1½–2 in. long, finely downy, 10–12-seeded.

Var. 1. *Walkeri*; stipules mostly subulate minute, leaves firmer smaller more acute nearly or quite glabrescent beneath. C. Walkeri, *Arnott in Nov. Act. Nat. Cur.* xviii. 398. C. semperflorens, *Benth. in Hook. Lond. Journ.* ii. 560. Ceylon, 4–7000 feet.—Looks generally quite distinct, but *Gardner's* No. 560 connects it with the type.

51. **C. Heyneana,** *Grah. in Wall. Cat.* 5414; branches terete, stipules small ½-lunate, leaves oblong acute narrowed at base, racemes lateral and terminal not panicled, pod subsessile obscurely downy 3–4 times the calyx. *W. & A. Prodr.* 187; *Benth. in Hook. Lond. Journ.* ii. 560; *Bot. Mag.* t. 5974.

Western Peninsula; Mysore, Travancor, and Canara.

General habit of *C. semperflorens*, of which it is most likely a mere variety. *Branches* woody, slender, soon glabrescent. *Leaves* membranous, distinctly petioled, 3–4 in., narrowed at both ends, hardly at all puberulent; stipules smaller. *Inflorescence* and bracts identical; pedicels ¼–⅓ in., slender, faintly puberulent. *Calyx* ⅜ in.; teeth lanceolate, very deep. *Corolla* slightly exserted. *Pod* 1¼–1½ in. long, clothed with deciduous fine pubescence, 10–12-seeded.

52. **C. leptostachya,** *Benth. in Hook. Lond. Journ.* ii. 562; branches angular, stipules 0 or minute subulate, leaves lanceolate acuminate, racemes lateral and terminal not panicled, pod oblong sessile densely velvety 2–3 times the calyx.

Western Peninsula; Concan, *Jacquemont, Stocks, Law.*

A stiff erect shrub with the habit and slender sulcate thinly silky branches of *C. juncea* and *tetragona.* *Leaves* 4–6 in., membranous, green, thinly clothed on both sides with shining brown silky hairs, rather rounded at the base. *Racemes* laxly 12–20-flowered, reaching ½ ft. long; bracts lanceolate very minute. *Calyx* ¼ in., densely silky; teeth linear, very deep. *Corolla* yellow, not exserted. *Pod* 5–6-seeded, ⅝–¾ in. long.

53. **C. tetragona,** *Roxb. Fl. Ind.* iii. 263; branches angular, stipules 0 or minute subulate, leaves large linear or lanceolate acuminate, racemes lateral and terminal not panicled, pod linear-oblong short-stalked rarely 2–3 times the calyx. *Andr. Bot. Rep.* t. 593; *DC. Prodr.* ii. 128; *Wall. Cat.* 5367, A-C.; *W. & A. Prodr.* 185. C. grandiflora, *Zolling. in Miq. Flor. Ind. Bat.* i. 333.

Kumaon (up to 3500 ft.), and along the Himalayas to Sikkim and Assam. Pegu, *McClelland.*—Distrib. Java.

A stiff shrub, reaching 6 ft. high, with sulcate thinly silky slender erecto-patent branches. *Leaves* short-stalked, distant, membranous, both sides thinly silky or glabrescent, reaching ½–1 ft. *Racemes* laxly 6–10-flowered, half a foot or more long;

bracts minute, linear. *Calyx* ¾–1 in. long, densely brown-velvety; teeth very long, linear or lanceolate, acuminate. *Corolla* lemon-yellow, glabrous, little exserted. *Pod* 1½–2 in. long, densely persistently dark-brown and velvety, 12–20-seeded.

54. **C. juncea,** *Linn.*; *DC. Prodr.* ii. 125; branches terete multisulcate, stipules 0 or minute subulate, leaves linear or oblong rather obtuse, racemes lateral and terminal not panicled, pod oblong sessile velvety twice the calyx. *Bot. Mag.* t. 490; *Roxb. Cor. Pl.* t. 193; *Fl. Ind.* iii. 259; *Wall. Cat.* 5409; *W. & A. Prodr.* 185; *Dalz. & Gibs. Bomb. Fl.* 54. C. fenestrata, *Bot. Mag.* t. 1933. C. benghalensis, *Lamk.*; *DC. Prodr.* ii. 125; *Wall. Cat.* 5395. C. tenuifolia, *Roxb. Fl. Ind.* ii. 263; *DC. Prodr.* ii. 126; *Wall. Cat.* 5368. C. porrecta, *Wall. Cat.* 5363. C. viminea, *Wall. Cat.* 5397 B. C. sericea, *Willd. not of Retz.*—*Rheede Hort. Mal.* ix. t. 26.

Plains from the HIMALAYAS to CEYLON, but often planted for its fibre. BIRMA, *Wallich*; PEGU, *McClelland*.—DISTRIB. Malay isles, Australia.

A stiff shrub several feet high, with slender virgate rigid thinly silky branches. *Leaves* rather distant, firm, linear or oblong, usually 1½–3 in., shining on both sides with thin short brown silky hairs. *Racemes* loosely 12–20-flowered, reaching a foot long; bracts minute, linear. *Calyx* ½–¾ in. long, densely clothed with ferruginous velvety hairs; teeth linear-lanceolate, very deep. *Corolla* bright yellow, glabrous, slightly exserted. *Pod* 1–1¼ in. long, clothed with short-spreading persistent silky hairs, 10–15-seeded. Yields Sun fibre.

55. **C. obtecta,** *Grah. in Wall. Cat.* 5372; branches terete, stipules 0 or minute deciduous, leaves oblong obtuse, racemes terminal and lateral not panicled, pod stalked densely velvety twice the calyx. *W. & A. Prodr.* 185; *Ic.* t. 208 and 383. C. tetragona, *Wall. Cat.* 5367 D.

WESTERN PENINSULA; Nilghiris and Cochin.

A tall *shrub*, with curved woody branches densely clothed with short brown silky hairs. *Leaves* short-stalked, coriaceous, 2–4-in., both sides more or less silky. *Racemes* rather close, 12–20-flowered; bracts minute, lanceolate. *Calyx* ¾–1 in., densely velvety, deeply bilabiate; teeth linear. *Corolla* slightly exserted; standard silky on the back. *Pod* 1½–2 in. long, 10–12-seeded, densely coated with dark brown velvety pubescence.

VAR. 1. *glabrescens*; branches and leaves glabrescent. C. glabrescens, *Benth. in Hook. Lond. Journ.* ii. 563.—Carnatic, near Courtallum, *Wight.*

***Flowers panicled.*

56. **C. madurensis,** *Wight in Wall. Cat.* 5376; leaves ovate-oblong closely silky, stipules 0, racemes panicled, bracts round cuspidate subdeciduous, calyx-teeth narrow, corolla exserted, pod many-seeded much exserted. *W. & A. Prodr.* 184; *Benth. in Hook. Lond. Journ.* ii. 563. C. candicans, *W. & A. Prodr.* 184.

NILGHIRIS and Madura hills, in the CARNATIC.

A stiff erect undershrub, copiously paniculately branched. *Branches* clothed with short dense brown silky hairs. *Leaves* short-petioled, obtuse, subcoriaceous, broadly rounded at base, 2–4 in., clothed on both sides with fine very short shining silky hairs. *Bracts* fewer and more deciduous than in other panicled Eriocarpæ. *Calyx* ½ in. deep, densely silky, deeply bilabiate; teeth narrow, acuminate, two upper lanceolate. *Corolla* ⅝ in.; standard rather pointed, densely silky on the back. *Pod* short-stalked, nearly glabrescent, 10–12-seeded, 1 in. long.

57. **C. subperfoliata,** *Wight in Wall. Cat.* 5377; leaves oblong acute closely silky, stipules 0, racemes panicled, bracts round spreading persistent,

calyx-teeth narrow, corolla twice calyx, pod many-seeded much exserted. *W. & A. Prodr.* 184; *Benth. in Hook. Lond. Journ.* ii. 563.

CARNATIC; Dindygul hills alt. 2000 ft., *Wight.*

General habit and inflorescence just as in *C. madurensis*, to which it is closely allied. *Leaves* thinner, narrowed to a point, less rounded at the base, 2–4 in. long. *Branches* densely clothed with short spreading silky hairs; bracts sometimes opposite, 1/8 in. long, densely silky on the back. *Calyx* 1/4–3/8 in. deep, finely silky; teeth lanceolate, acuminate, with reflexed borders. *Corolla* 5/8–3/4 in.; standard rather pointed, silky on the back. *Pod* oblong, stalked, twice the calyx, with 12 or more seeds.

58. **C. fulva,** *Roxb. Fl. Ind.* iii. 266; leaves oblanceolate closely silky, stipules 0 or minute subulate, racemes panicled, bracts ovate cuspidate, calyx-teeth broad foliaceous, corolla slightly exserted, pod oblong 2-seeded included. *Wall. Cat.* 5375; *W. & A. Prodr.* 183; *Dalz. & Gibs. Bomb. Fl.* 54. C. pulchra, *DC. Prodr.* ii. 126, *not of Andrews.* C. grandis, *Hort. Calcutt.*

MAISOR, the CONCAN, NILGHIRIS, and CEYLON.—DISTRIB. Java, Sumatra, and naturalised in the Seychelles and Mauritius.

A stiff erect shrub 3–5 feet, copiously paniculately branched. *Branches* densely clothed with short brown silky hairs. *Leaves* nearly sessile, subcoriaceous, 3–4 in. long, obtuse or subacute, cuneate at the base, shining on both sides, with a silky lustre from minute hairs. *Branches* elongated with several bracts flowerless. *Calyx* 1/2–5/8 in. deep, densely silky, with a pair of conspicuous bracteoles; upper teeth oblong, lower lanceolate. *Corolla* 3/4–1 in.; standard rather pointed, densely silky on the back. *Pod* thinly silky, sessile, about as long as the calyx.

59. **C. pulcherrima,** *Roxb. Fl. Ind.* iii. 267; leaves oblanceolate-oblong closely silky, stipules 0, racemes panicled, bracts copious ovate-acuminate reflexed, upper calyx-teeth broad foliaceous, corolla scarcely exserted, pod oblong included 5–6-seeded. *Bot. Mag.* t. 2027; *Wall. Cat.* 5374; *DC. Prodr.* ii. 125; *W. & A. Prodr.* 184; *Wt. Ic.* t. 481. C. pulchra, *Andr. Bot. Rep.*, t. 601, *not of DC.*

NILGHIRIS.

A stiff erect shrub 3–4 ft. high, copiously paniculately branched. *Leaves* nearly sessile, subcoriaceous, obtuse or subacute, cuneate at the base, 3–4 in. long, shining on both sides with dense short close brown silky hairs. *Flowers* few, near the top of the branches; bracts numerous, large, reflexed, persistent; pedicels short, densely silky. *Calyx* 5/8–3/4 in. long; upper segments oblong, lower lanceolate; standard silky on the back. *Pod* oblong, bright brown, sessile, as long as the calyx.

60. **C. lunulata,** *Heyne in Wall. Cat.* 5378; leaves oblanceolate acute loosely silky, stipules small obtuse, racemes panicled, bracts copious persistent like the stipules, calyx-teeth narrow, corolla twice the calyx, pod oblong 1-seeded scarcely exserted. *W. & A. Prodr.* 183; *Wight Ic.* t. 480; *Benth. in Hook. Lond. Journ.* ii. 564.

Tanjore, in the CARNATIC; CEYLON.

A stiff erect undershrub, copiously paniculately branched, clothed with dense spreading brown silky hairs. *Leaves* short-petioled, moderately firm, densely silky, cuneate at the base, usually 1–2 in. *Branches* elongated, with numerous amplexicaul reflexed small bracts below the flowers. *Calyx* densely silky, 3/8–1/2 in. long; teeth long, all linear, the edges slightly recurved. *Corolla* 3/4–7/8 in.; standard rather pointed, thinly silky on the back. *Pod* sessile, finely silky, as long as the calyx.

61. **C. ramosissima,** *Roxb. Fl. Ind.* iii. 268; leaves small oblanceolate densely silky, stipules 0, racemes panicled, bracts lanceolate persistent, calyx-teeth narrow, corolla little exserted, pod 1-seeded scarcely exserted. *W. & A.*

Prodr. 183. C. tomentosa, *Rottl. in Wall. Cat.* 5380. C. pellita, *Bert.*; *DC. Prodr.* ii. 128? C. Campbellii, *Arn. in Wight. Cat.* 2316.

WESTERN PENINSULA, *Rottler, Heyne*; interior of BENGAL, *Roxburgh.*

Shrubby, erect, much branched. *Stems* a foot or less high, densely coated, like the leaves, with thick silky brown hairs. *Leaves* crowded, subsessile, subobtuse, thick, cuneate at the base, $\frac{3}{4}$–1 in. long. *Branches* densely pubescent, generally short. *Bracts* not abundant, small, falcate, silky on the back, black and viscous on the face. *Calyx* $\frac{1}{4}$ in. long; teeth long, linear, with reflexed edges. *Corolla* $\frac{3}{8}$ in.; standard pointed, silky on the back. *Pod* sessile, as long as the calyx, oblong, densely silky.

62. **C. paniculata,** *Willd.*; *DC. Prodr.* ii. 126; leaves small oblanceolate loosely silky, stipules linear, racemes panicled, bracts copious persistent falcate linear-subulate, calyx-teeth narrow, corolla exserted, pod 1–2-seeded scarcely exserted. *Roxb. Fl. Ind.* iii. 274; *Wall. Cat.* 5379; *W. & A. Prodr.* 183. C. chinensis, *Lamk. Dict.* ii. 195, *not of Linn.* Ononis glutinosa, *Mart. in Denk. Acad. Mun.* vi. 155.

CARNATIC, near Vellore.—DISTRIB. Java.

Shrubby, 2–3 feet high, with very numerous stiff ascending branches, clothed with loose brown silky hairs. *Leaves* 1–1$\frac{1}{2}$ in. long, obtuse, loosely silky, cuneate at the base, nearly sessile; stipules just like the very copious bracts, conspicuous, falcate, with reflexed glandular margins. *Branches* short, with a few flowers near the end. *Calyx* $\frac{1}{4}$ in.; teeth long, silky on the back, lanceolate or linear with recurved viscous edges like the bracts and bracteoles. *Corolla* $\frac{1}{2}$–$\frac{5}{8}$ in.; standard very silky on the back. *Pod* oblong, sessile, finely silky.

GROUP 8. **Trifoliolatæ Dispermæ.** *Leaves* 3-foliolate. *Pod* obliquely subglobose, small, sessile, 2-seeded. Perennial herbs or undershrubs. Cyrtolobus, *R. Br.*

63. **C. medicaginea,** *Lamk. Dict.* ii. 201; herbaceous, branches slender diffuse thinly clothed with adpressed silky hairs, petiole shorter than the small oblanceolate leaflets, racemes 2–6-flowered, corolla twice the calyx. *W. & A. Prodr.* 192; *Benth. in Hook. Lond. Journ.* ii. 577; *Thwaites Enum.* 82; *Boiss. Fl. Orient.* ii. 26. C. procumbens, *Roxb. Hort. Beng.* 98; *Fl. Ind.* iii. 278, *et Wall. Cat.* 5437, *in part.* C. foliosa, *Willd.*; *DC. Prodr.* ii. 131. C. divaricata, *Grah. in Wall. Cat.* 5436. C. virgata, *Mart.*; *DC. Prodr.* ii. 131. Indigofera capitata, *Grah. in Wall. Cat.* 5490.

Tropical region, from the WEST HIMALAYAS to CEYLON and BIRMA, ascending to 6000 ft. in Kashmir.—DISTRIB. Malay isles, Afghanistan, China and Australia.

A diffuse *perennial*, with slender much-branched stems, $\frac{1}{2}$–1 ft. long, thinly silky upwards. *Stipules* setaceous, very minute, deciduous; leaflets $\frac{1}{4}$–$\frac{1}{2}$ in. long, retuse emarginate, glabrous above, obscurely silky below. *Racemes* copious, terminal and leaf-opposed; peduncles exceeding the leaves; bracts minute, linear. *Calyx* thinly silky, campanulate, $\frac{1}{8}$ in. deep; teeth linear, exceeding the tube. *Corolla* yellow. *Pod* $\frac{1}{8}$ in. long, glabrescent.

VAR. 1. *herniarioides*; stems prostrate very slender, leaflets very small nearly or quite as broad as long, peduncles short 1–3-flowered. C. herniarioides, *W. & A. Prodr.* 192.

VAR. 2. *neglecta*; branches more robust and more ascending than in the type, racemes 6–9-flowered, leaflets rather larger. C. neglecta, *W. & A. Prodr.* 192. C. procumbens, *Roxb. & Wall. ex parte.*

VAR. 3. *luxurians*; stems much stronger, 2–3 ft. high, petioles reaching $\frac{1}{2}$ in. long, terminal leaflet $\frac{3}{4}$–1 in., racemes 6–12-flowered. C. luxurians, *Benth. in Hook. Lond. Journ.* ii. 578. C. medicaginea, *Hamilt. in Wall. Cat.* 5434.

64. **C. Willdenoviana,** *DC. Prodr.* ii. 134; herbaceous or suffruticose,

branches often stiff clothed with short fine down, petiole shorter than the small oblanceolate leaflets, racemes 3–6-flowered, corolla thrice the calyx. *W. & A. Prodr.* 191; *Benth. in Hook. Lond. Journ.* ii. 579. C. spartioides, *Spreng.*; *Wall. Cat.* 5435. C. genistoides, *Willd. Sp. Pl.* iii. 987, *non Lamk.*

WESTERN PENINSULA.

Perennial, reaching 2–3 ft. high, with very numerous ascending elongated branches. *Stipules* small, setaceous, persistent; leaflets $\frac{3}{8}$–$\frac{1}{2}$ in. long, firm, obtuse, emarginate, silky on both sides. *Racemes* copious, terminal and lateral; bracts minute, linear-setaceous, persistent. *Calyx* $\frac{1}{8}$ in. long, finely downy; teeth linear, exceeding the tube. *Corolla* yellow; keel with a narrower and longer beak than in the last. *Pod* pubescent, $\frac{1}{8}$ in. long.

65. **C. trifoliastrum,** *Willd. Sp. Pl.* iii. 983; herbaceous, branches elongated ascending finely downy, petioles exceeding the obovate-oblong leaflets, racemes elongated 12–40-flowered, corolla thrice the calyx. *Roxb. Fl. Ind.* iii. 277; *Wall. Cat.* 5432, *excl. G. H.*; *W. & A. Prodr.* 191; *Wight Ic.* t. 421. C. virgata, *Roxb. in E. I. C. Mus.* tab. 373. C. medicaginea, *DC. Prodr.* ii. 133. C. stricta, *Roth.*; *DC. Prodr.* ii. 133. Lupinus trifoliatus, *Rottl. in Nov. Act. Ber.* iv. 223, t. 5. C. stipitata, *Grah. in Wall. Cat.* 5425, A.

ASSAM and WESTERN PENINSULA.

An erect *perennial* 2–3 ft. high, with numerous erecto-patent slender branches. *Petioles* an inch or more; stipules minute, setaceous; leaflets membranous, $\frac{1}{2}$–1 in. long, glabrous above, obscurely silky below, obtuse at the point, often deeply emarginate. *Racemes* copious, both terminal and lateral, short-peduncled, reaching 4–6 in. long; bracts minute, setaceous. *Calyx* $\frac{1}{8}$ in. long, finely silky; teeth linear, twice the length of the tube. *Corolla* yellow, glabrous. *Pod* subquadrangular, sessile, thinly silky, $\frac{1}{8}$ in. long.

66. **C. Notonii,** *W. & A. Prodr.* 192; shrubby, branchlets elongated obscurely silky, leaflets middle-sized obovate-oblong, racemes closely 12–20-flowered, corolla 2–3 times the calyx. *Wight Ic.* t. 752. C. trifoliastrum, *Wall. Cat.* 5432, G. C. rostrata, *W. & A. Prodr.* 191.

NILGHIRIS and PULNEY MOUNTAINS.

Branches firm, ascending, terete, clothed with minute grey silky hairs. *Stipules* setaceous, persistent, $\frac{1}{8}$ in.; petioles shorter than the leaflets; leaflets cuneate in the lower half, reaching 1–1$\frac{1}{4}$ in. long, green and glabrous above, thinly silky below. *Racemes* copious, short-peduncled lateral and terminal, 1–3 in. long; bracts small, setaceous. *Calyx* thinly silky, $\frac{1}{6}$ in. long; teeth lanceolate, equalling the tube. *Corolla* yellow; keel with a very long beak. *Pod* $\frac{1}{4}$ in. long, subquadrangular, thinly silky.

67. **C. rigida,** *Heyne*; *DC. Prodr.* ii. 133; shrubby, branchlets short stiff obscurely silky, leaflets minute obcordate, racemes 2–6-flowered, corolla 2–3 times the calyx. *W. & A. Prodr.* 191.

CARNATIC, *Heyne*, *G. Thomson*.

A low *shrub* with very numerous woody subpatent branches, the old ones glabrescent, the copious branchlets almost spiny in old plants. *Stipules* setaceous, very minute; petiole very short; leaflets pale green, thick, obscurely silky, not more than $\frac{1}{8}$ in. long. *Racemes* copious, close, all terminal; bracts linear, very minute. *Calyx* $\frac{1}{8}$ in. long, thinly silky; teeth lanceolate, equalling the tube. *Corolla* yellow, glabrous; beak of keel long and narrow. *Pod* $\frac{1}{8}$ in. long, thinly silky.

GROUP 9. **Trifoliolatæ Polyspermæ.** *Leaves* 3-foliolate. *Pod* oblong or cylindrical, stalked or sessile, glabrous or pubescent, many-seeded. Herbs or shrubs.

68. **C. orixensis,** *Rottl.*; *DC. Prodr.* ii. 131; herbaceous, diffuse, thinly hairy, leaflets obovate-oblong obtuse, racemes very lax, bracts foliaceous persistent, corolla small scarcely exserted, pod oblong glabrous long-stalked. *Roxb. Hort. Beng.* 98; *Fl. Ind.* iii. 276; *Wall. Cat.* 5426; *W. & A. Prodr.* 193; *Dalz. & Gibs. Bomb. Fl.* 57. C. macropoda, *A. Rich. Fl. Abyss.* i. 157.

Plains throughout the WESTERN PENINSULA.—DISTRIB. Abyssinia.

Perennial, with spreading slender copiously-branched stems, 1–1½ ft. long, clothed with short spreading brown hairs, which are bulbous at the base. *Stipules* linear, persistent; petiole ½–1 in.; leaflets 1–1½ in. long, moderately firm, glabrous above, thinly clothed with long hairs below. Lateral *racemes* numerous, 3–12-flowered; bracts large, ovate-acuminate, reflexed; pedicels filiform, 3–4 times the calyx. *Calyx* ⅙ in. long; teeth linear, long. *Pod* ½–⅝ in. long, 8–10-seeded, with a stalk as long as the calyx.—The only representative of the *Diffusæ* in the trifoliolate series.

69. **C. lævigata,** *Lamk.*; *DC. Prodr.* ii. 131; fruticose, obscurely downy, leaflets obovate-oblong obtuse, racemes terminal 2–4-flowered, bracts minute setaceous, corolla 2–3 times the calyx, pod oblong glabrous long-stalked. *Benth. in Hook. Lond. Journ.* ii. 576. C. stipitata, *Grah. in Wall. Cat.* 5425, B.; *W. & A. Prodr.* 193.

Plains of the WESTERN PENINSULA.

A small *shrub*, with long slender terete erecto-patent branches, finely downy or glabrescent. *Stipules* minute, setaceous, deciduous; petiole as long as leaves; leaflets ½–1½ in. long, green and glabrous above, pale and obscurely silky below. *Racemes* subcorymbose at the end of copious branchlets; pedicels cernuous, bracteolate, thinly silky. *Calyx* ¼ in. deep, thinly silky; teeth lanceolate, as long as the tube. *Corolla* yellow, ⅝–¾ in.; keel with a very long beak. *Pod* ½–¾ in. long, 8–10-seeded, with a stalk as long as the calyx.

70. **C. incana,** *Linn.*; *DC. Prodr.* ii. 132; suffruticose, loosely downy, leaflets obovate obtuse, racemes terminal and lateral elongated, bracts minute, corolla slightly exserted, pod subsessile cylindrical loosely pubescent. *Bot. Reg.* t. 377. C. affinis, *DC. Prodr.* ii. 132. C. Schimperi, *A. Rich. Fl. Abyss.* i. 151. C. herbacea, *Schweig. in Schranck Syll.* ii. 77.

KUMAON; 5000 ft., *Strachey* and *Winterbottom*, *Edgeworth*; CEYLON, *Gardner*, &c. Perhaps naturalised only.—DISTRIB. Malay isles, Trop. Africa and America, common.

An *undershrub*, 2–4 ft. high, with robust terete branches, the whole plant, including calyx and pod, clothed with fine spreading brown silky hairs. *Stipules* setaceous, minute; leaflets 1½–2 in. long, very obtuse, cuneate in the lower half, membranous. *Racemes* closely 12–20-flowered, reaching 6–9 in. long. *Calyx* ¼ in. long; teeth long, lanceolate. *Pods* deflexed, rather recurved, 1–1½ in. long, 20–30-seeded.

71. **C. clavata,** *W. & A. Prodr.* 194; shrubby, obscurely downy, leaflets obovate obtuse, racemes terminal and lateral elongated, bracts minute setaceous, corolla much exserted, pod thinly silky oblong-cylindrical short-stalked. *Benth. in Hook. Lond. Journ.* ii. 587. C. cytisoides, *Wight in Wall. Cat.* 5424, D.

CARNATIC; Dindygul hills, *Wight*.

A low *shrub* with arcuate ascending terete glabrescent branches. *Stipules* setaceous, very minute; petiole shorter than the leaflets; leaflets thick, rather fleshy, obtuse, cuneate in the lower half, pale, subglabrous. *Racemes* 20–30-flowered, short-peduncled, reaching ½ ft. long. *Calyx* campanulate, thinly silky, ⅛–⅙ in. long; teeth lanceolate, as long as the tube. *Corolla* yellow, glabrous, ⅜ in. long. *Pod* deflexed, rather recurved, 10–12-seeded.

72. **C. bracteata,** *Roxb. Fl. Ind.* iii. 378; shrubby, obscurely downy, leaflets large oblong acute, racemes terminal and lateral elongated, bracts minute

setaceous, corolla much exserted, pod subsessile oblong-cylindrical densely pubescent. *Wall. Cat.* 5423; *Benth. in Hook. Lond. Journ.* ii. 586.

BHOTAN, CHITTAGONG, BIRMA, PEGU, TENASSERIM.—DISTRIB. Malay isles, Philippines.

A low *shrub* with elongated flexuose slender finely downy or glabrescent branches. *Stipules* setaceous, very minute; petiole 2–3 in.; leaflets membranous, narrowed to both ends, 2–4 in. long, glabrous above, obscurely silky below. *Racemes* short-peduncled, closely 12–30-flowered. *Calyx* $\frac{1}{6}$ in. long, finely silky; teeth lanceolate, as long as tube. *Corolla* pale yellow, $\frac{3}{8}$–$\frac{1}{2}$ in. long. *Pods* deflexed, rather recurved, hard, 8–10-seeded, densely clothed with spreading pale brown hairs.

73. **C. striata,** *DC. Prodr.* ii. 131; shrubby, obscurely silky, leaflets obovate-oblong obtuse or subacute, racemes terminal and lateral elongated, bracts setaceous minute, corolla twice the calyx, pod short-stalked glabrous cylindrical. *Bot. Mag.* t. 3200. C. Brownei, *Reich. Icon. Exot.* t. 232; *DC. Prodr.* ii. 130. C. Hookeri, *Arn. in Ann. Sc. Nat.* ser. ii. 3, 248. C. pisiformis, *Guill. & Per. Fl. Seneg.* 162. C. Saltiana, *Andr. Bot. Rep.* t. 648. C. latifolia, *Hort. Calc.* C. pallida and laburnoides, *Klotzsch in Peters. Mossam. Bot.* 57.

HIMALAYAS to CEYLON and MALACCA.—DISTRIB. Malay isles and spread through Tropical America and Africa.

An erect low *shrub* 2–4 ft. high, with robust sulcate thinly silky branches. *Stipules* minute, setaceous, deciduous; petiole 2–3 in.; leaflets membranous, 3–4 in. long, usually subobtuse, green and glabrous above, pale and obscurely silky below. *Racemes* 20–50-flowered, reaching $\frac{1}{2}$–1 ft. long. *Calyx* $\frac{1}{4}$ in. long, thinly silky; teeth lanceolate, as long as the tube. *Corolla* glabrous, yellow striped with red. *Pods* deflexed, rather recurved, 1$\frac{1}{2}$–2 in. long, 20–30-seeded.

74. **C. laburnifolia,** *Linn.*; *DC. Prodr.* ii. 130; shrubby, glabrous, leaflets obovate-oblong acute, racemes elongated very lax, bracts minute deciduous, corolla large much exserted, pod cylindrical glabrous long-stalked. *Wall. Cat.* 5424, *excl. D*; *Roxb. Fl. Ind.* iii. 275; *W. & A. Prodr.* 193; *Dalz. & Gibs. Bomb. Fl.* 57. C. pendula, *Bert.*; *DC. Prodr.* ii. 130. C. pedunculosa, *Desv.*; *DC. Prodr.* ii. 132. Clavulium pedunculosum, *Desv. in Ann. Sc. Nat.* ix. 407; *Rheede Hort. Mal.* ix. t. 27; *Burm. Zeyl.* t. 35.

WESTERN PENINSULA, CEYLON, MALACCA.—DISTRIB. Philippines and Malay isles.

A low *shrub* with slender elongated terete branches. *Stipules* 0; petiole 2–3 in.; leaflets membranous, glabrous, 1–2 in. long, cuneate at the base. *Racemes* terminal and lateral, $\frac{1}{2}$–1 ft. long; pedicels exceeding the calyx. *Calyx* glabrous, turbinate, $\frac{1}{4}$–$\frac{3}{8}$ in. long; teeth lanceolate, as long as the tube. *Corolla* bright yellow, glabrous, 1 in. deep; keel very broad with a long incurved beak. *Pod* 1$\frac{1}{2}$–2 in. long, 20–30-seeded; gynophore filiform, $\frac{3}{4}$–1 in. long, much exceeding that of any other species.

GROUP 10. **Multifoliolatæ.** *Leaves* usually 5-, but varying from 3- to 7-foliolate. *Pod* glabrous, oblong or linear-oblong, distinctly stalked, many-seeded. Herbs or under-shrubs.

75. **C. quinquefolia,** *Linn.*; *DC. Prodr.* ii. 135; herbaceous, branches and leaves below thinly silky, leaflets linear, bracts linear thinly silky, lower pedicels at last as long as the calyx. *Roxb. Fl. Ind.* iii. 279; *Dalz. & Gibs. Bomb. Fl.* 57; *Wall. Cat.* 5429; *W. & A. Prodr.* 194; *Ill.* t. 16—*Rheede Hort. Mal.* ix. t. 28.

WESTERN PENINSULA, CEYLON, BIRMA, TENASSERIM.—DISTRIB. Malay isles, Philippines.

An erect *annual* 2–4 ft. high, with robust straight sulcate branches. *Stipules* linear, subpersistent; petioles 1–3 in.; leaflets usually 5, rarely 3, linear, rarely narrow oblanceolate, 2–4 in. long, obtuse, glabrous above. *Racemes* usually terminal,

laxly 10–20-flowered, reaching ½ ft. long; bracts persistent, as long as the pedicels. *Calyx* campanulate, subglabrous, ½ in. long; teeth lanceolate, as long as the tube. *Corolla* glabrous, twice the calyx. *Pod* oblong, glabrous, distinctly stalked, 1½–2 in. by ¾–1 in., 30–40-seeded.—*C. heterophylla*, L. DC. Prodr. ii. 131, is a trifoliolate form.

76. **C. Grahamiana,** *W. & A. Prodr.* 194; shrubby, branches and leaves below densely clothed with adpressed silky hairs, leaflets oblanceolate, bracts linear thinly silky, lower pedicels as long as the calyx. C. digitata, *Wight in Wall. Cat.* 5430, *non Hook.*

CARNATIC; Pulney hills at 4000 ft.

Branches firm, elongated, angular, persistently silky. *Stipules* linear, reflexed, persistent; petiole reaching 3–4 in., silky like the branches; leaflets thicker than in *C. quinquefolia*, 2–3 in. long, often 7, glabrous above, obtuse. *Racemes* closely 12–30-flowered, ¼–½ ft.; bracts ⅓–¾ in., acuminate, reflexed, persistent. *Calyx* just like that of *C. quinquefolia*. *Corolla* yellow, glabrous, half as long again as the calyx. *Pod* linear-oblong, 1½–2 in. long, distinctly stalked.

77. **C. digitata,** *Hook. Bot. Misc.* ii. 354, *suppl.* t. 16 (C. quinquefolia); shrubby, branches and leaves on both sides clothed with loose soft tomentum, leaflets obovate-cuneate, bracts lanceolate tomentose, pedicels twice the calyx. *W. & A. Prodr.* 194, *non Wight in Wall. Cat.* 5430.

CARNATIC; Madura hills, *Wight.*

A low *shrub*; the whole plant, except calyx and corolla, clothed with loose soft pale brown velvety tomentum. *Stipules* ½ in. long, linear-setaceous, reflexed, persistent; petiole 2–3 in.; leaflets 3–5, thick and soft, cuneate in the lower half, very obtuse, the end one reaching 2½–3 in. long, ¾–1 in. broad, the outermost sometimes unequal-sided. *Racemes* terminal and lateral, short-peduncled, closely 12–20-flowered; bracts lanceolate acuminate, densely velvety, patent, persistent. *Calyx* glabrous, ⅝–¾ in. long; teeth lanceolate, as long as the tube. *Corolla* yellow, glabrous, 1 in. long. *Pod* linear-oblong, 2–2½ in. long.

C. ELLIPTICA, *Roxb. in Wall. Cat.* 5433 (C. Vachellii, *H. & A.*), and C. VASCULOSA, *Grah. in Wall. Cat.* 5427, have no claim to rank as Indian species, having been introduced to the Calcutta Garden, the former from China, and the latter from Mauritius.

9. ONONIS, Linn.

Undershrubs or herbs, often viscid. *Leaves* with pinnately 3-foliolate toothed leaflets. *Calyx-tube* campanulate; teeth long, subequal. *Petals* clawed; standard roundish; wings obovate-oblong; keel incurved, acute. *Stamens* monadelphous, the alternate filaments dilated at the apex; anthers dimorphous. *Ovary* in our plant subsessile, few-ovuled; style filiform, abruptly incurved, stigma minute oblique. *Pod* oblong, turgid, continuous within.—DISTRIB. Species 60, mainly Mediterranean and European.

1. **O. hircina,** *Jacq. Hort. Vind.* t. 93; *Boiss. Fl. Orient.* ii. 56. O. altissima, *Lam. Dict.* i. 506; *DC. Prodr.* ii. 162. O. arvensis, *Linn. herb. in part.* O. procurrens, *Benth. in Royle Ill.* 197.

TEMPERATE WEST HIMALAYA; TIBET and KASHMIR, alt. 5–7000 ft.—DISTRIB. Orient, West Siberia, Europe.

An *undershrub*, with ascending unarmed pubescent stems. *Stipules* large, leafy, adnate to the short petioles; leaflets oblong, obtuse. *Flowers* reddish, in pairs at the axils of the leaves, forming a close leafy raceme at the end of the branches. *Calyx* ⅜ in.; teeth linear, exceeding the tube. *Pod* oblong, downy, not exserted, 2–3-seeded.

10. **TRIFOLIUM,** Linn.

Annual or perennial herbs. *Leaves* with stipules adnate to the petiole and digitately 3-foliolate leaflets. *Flowers* small, copious, in dense axillary heads. *Calyx* tube turbinate; teeth mostly 5 subequal. *Corolla* adnate to the staminal tube, and fading without falling; standard and wings narrow; keel straight, obtuse. *Stamens* diadelphous; filaments more or less dilated; anthers uniform. *Ovary* sessile or stalked, few-ovuled; style filiform, incurved above the base; stigma oblique. *Pod* minute, included, membranous, indehiscent, 1 or few-seeded.—DISTRIB. Species perhaps 200, mostly European and Oriental, many N. American and Trop. African.

T. MINUS, *Smith*, is included in Hohenacker's Neilgherry plants, no doubt from introduced specimens.

T. RESUPINATUM, *Linn.*, is largely cultivated in Afghanistan, Hazara and Khagan, in the subtropical zone.

1. **T. pratense,** *Linn.*; *DC. Prodr.* ii. 195; erect, heads subtended by a pair of opposite leaves, calyx not accrescent. *Boiss. Fl. Orient.* ii. 115.

KASHMIR to GARWHAL, 4–8000 ft.—DISTRIB. Afghanistan, Siberia, Orient, Europe. *Perennial*; stems a foot or more high, slightly downy. *Stipules* very broad; leaflets oblong; toothing obscure. *Heads* roundish; flowers very dense, usually red. *Calyx* pubescent; teeth setaceous, the lowest longer than the rest, exceeding the tube. *Pod* 1-seeded, opening by a lid.—One of the common forage clovers.

2. **T. repens,** *Linn.*; *DC. Prodr.* ii. 198; trailing, peduncles elongated naked, calyx not accrescent. *Boiss. Fl. Orient.* ii. 145. T. venulosum, *Royle MSS.*

TEMPERATE and ALPINE HIMALAYA, ascending to 20,000 ft.; NILGHIRIS and CEYLON, perhaps introduced.—DISTRIB. Through Europe and Asia, also North America.

Stems slender, glabrous, wide-creeping. *Stipules* narrow; petioles and peduncles long, ascending; leaflets obovate emarginate, distinctly toothed. *Heads* globose, not dense; flowers finally deflexed. *Calyx* glabrous; teeth subequal, shorter than the tube. *Corolla* white or with a pink tinge. *Pod* minute, linear, 3–4-seeded.—Commonly cultivated.

3. **T. fragiferum,** *Linn.*; *DC. Prodr.* ii. 202; trailing, peduncles elongated naked, fruit calyx accrescent. *Boiss. Fl. Orient.* ii. 135.

KASHMIR, temperate zone, *Jacquemont*, *Thomson*.—DISTRIB. Europe, Orient, N. Africa, Abyssinia.

Habit of *T. repens*, for which it is easily passed over in flower. *Stipules* lanceolate, with cuspidate points; petioles and peduncles elongated; leaflets less distinctly toothed. *Corolla* a deeper pink. *Calyx* in fruit becoming an ovoid membranous persistent bladder, enclosing the small 1–2-seeded pod.

11. **PAROCHETUS,** Hamilt.

A slender creeping herb. *Leaves* 3-foliolate. *Flowers* on axillary peduncles. *Calyx* tube campanulate; two upper teeth subconnate. *Corolla* free from staminal tube; standard broad, obovate clawed; wings much shorter, obtuse; keel as long as the wings, incurved and subacute at the tip. *Stamens* diadelphous; filaments not dilated; anthers uniform. *Ovary* sessile, linear, ∞-ovulate; style elongated, glabrous, suddenly incurved above the base, stigma terminal. *Pod* linear, turgid, continuous within. A single species.

1. **P. communis,** *Hamilt.*; *DC. Prodr.* ii. 403; *Wall. Cat.* 5972; *Royle Illust.* t. 35; *Don. Prodr.* 241. P. major, *Don Prodr.* 241; *DC. Prodr. loc.*

cit.; *Wall. Cat.* 5525; *W. & A. Prod.* 252; *Wight Ic.* t. 483. P. oxalidifolia, *Royle Illust.* 201. P. maculata, *R. Br. in Benn. Pl. Jav. Rar.* 162, t. 34.

ALPINE, TEMPERATE and SUBTROPICAL HIMALAYA from SIMLA and GARWHAL to ASSAM, alt. 4–13,000 ft. NILGHIRIS, CEYLON, BIRMA, *Wallich*; TENASSERIM, *Parish.*—DISTRIB. Java, Zambesi-land.

Rhizome thread-like, wide-creeping. *Petiole* long, filiform, bearing *leaves* like those of *Oxalis Acetosella*; leaflets subsessile, obovate, cuneate, emarginate, entire, glabrous or slightly pubescent. *Peduncles* overtopping the leaves, 1–2-flowered. *Calyx* $\frac{1}{4}$ in. deep; teeth lanceolate. *Corolla* $\frac{1}{2}$–$\frac{3}{4}$ in., purplish-white. *Pod* straight, glabrous, linear, $\frac{3}{4}$–1 in. long.

12. TRIGONELLA, Linn.

Annual herbs. *Leaves* pinnately 3-foliolate, toothed. *Flowers* racemed, lemon-yellow. *Calyx* tube campanulate; teeth distinct, subequal. *Petals* free from the staminal tube; standard and wings narrow; keel shorter, obtuse. *Stamens* diadelphous; filaments not dilated; anthers uniform. *Ovary* sessile, many-ovuled; style glabrous; stigma terminal. *Pod* linear or linear-oblong, compressed or subterete, not spiral, usually exserted, many-seeded, continuous within.—DISTRIB. Species 50, mostly Mediterranean and Oriental. Many cultivated for forage.

* *Pod short, turgid.*

1. **T. occulta,** *Delile*; *DC. Prodr.* ii. 185; *Boiss. Fl. Orient.* ii. 84. T. arguta, *Visiani Pl. Ægypt.* 33, t. 8, fig. 1.

Plains of SCINDE, *Stocks*; UPPER GANGETIC PLAIN, near Lucknow, *Anderson.*—DISTRIB. Egypt, Nubia.

Diffuse, densely cæspitose, glabrous or subglabrous, *annual*, with slender stems a few in. long. *Stipules* deeply laciniated; petiole exceeding the sharply-toothed minute oblanceolate cuneate leaflets. *Flowers* 2–4 together in copious sessile axillary clusters. *Calyx* $\frac{1}{8}$ in.; teeth linear-setaceous. *Corolla* slightly exserted. *Pod* elliptical, scarcely exserted, glabrous, usually 2-seeded.

** *Pod long, turgid.*

2. **T. Fœnum-græcum,** *Linn.*; *DC. Prodr.* ii. 182; pod large long-beaked, reticulations distant not transverse. *Roxb. Fl. Ind.* iii. 389; *Wall. Cat.* 5984; *W. & A. Prodr.* 195; *Sibth. & Sm. Fl. Græca*, t. 766; *Boiss. Fl. Orient.* ii. 70.

KASHMIR, PUNJAB, UPPER GANGETIC PLAIN, &c.—DISTRIB. South Europe and Orient, widely cultivated.

Annual, robust, erect, subglabrous. *Stipules* not laciniated; leaflets toothed, $\frac{3}{4}$–1 in. long, oblanceolate-oblong. *Flowers* 1–2, sessile in the axils of the leaves. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in., teeth linear. *Corolla* much exserted. *Pod* 2–3 in. long, 10–20-seeded, with a long persistent beak, often falcate.

3. **T. polycerata,** *Linn.*; *DC. Prodr.* ii. 184; pod small not beaked, reticulations close transverse, flowers 1–6 in a sessile or short-peduncled umbel. T. incisa, *Royle Ill.* 197; *Camb. in Jacq. Voy. Bot.* 36, t. 42; *Boiss. Fl. Orient.* ii. 76. T. pinnatifida, *Cav.*; *DC. Prodr.* ii. 183. T. monantha, *C. A. Meyer in Led. Fl. Ross.* i. 534; *Boiss. Fl. Orient.* ii. 77. T. orthoceras, *Kar. & Kir.*; *Walp. Rep.* i. 637; *Boiss. Fl. Orient.* ii. 77. T. geminiflora, *Bunge Rel. Lehm.* 71. T. brahuica, *Boiss. Fl. Orient.* ii. 73.

PUNJAB and UPPER GANGETIC PLAIN, ascending to 6000 ft.—DISTRIB. West Siberia, Orient, South Europe to Spain.

Annual, more slender, branched and diffuse than in the last. *Stipules* not laciniated; points setaceous; leaflets smaller, sharply inciso-dentate or even pinnatifid,

obovate; base deltoid, entire. *Flowers* 1–6 usually 2–4, sessile or on a short common peduncle in the axil of leaf. *Calyx* $\frac{1}{6}$ in., subcylindrical; teeth setaceous, shorter than tube. *Corolla* slightly exserted. *Pod* 1–2 in. long, falcate, $\frac{1}{12}$ in. broad, much wrinkled transversely, 10–20-seeded.

4. **T. hamosa,** *Linn.*; *DC. Prodr.* ii. 183; pod small not beaked, reticulations close transverse, flowers 6–12 in short-peduncled racemes. *Boiss. Fl. Orient.* ii. 84. T. obcordata, *Wall. Cat.* 5986; *Benth. in Royle Ill.* 197. T. nervosa, *Klotzsch in Reise Pr. Wald. Bot.* 158, t. 1, fig. 1.

Included amongst Wallich's plants, with the habitat of Tikari (*Hamilton*), but a doubtful native of India proper.—DISTRIB. Afghanistan, Egypt, Nubia, Cape.

Annual, glabrous. *Stems* cæspitose, diffuse, 1 ft. or more long. *Stipules* broad, deeply cut; leaflets obovate-cuneate, shallowly toothed, $\frac{3}{8}$–$\frac{1}{2}$ in. long; base deltoid, entire. *Racemes* close, equalling or falling short of the leaves, terminated by a spine. *Calyx* short-pedicelled, under $\frac{1}{12}$ in. deep; teeth lanceolate, shorter than the tube. *Corolla* three times the calyx. *Pod* $\frac{3}{8}$–$\frac{1}{2}$ in. long, much curved, 4–6-seeded.

*** *Pod linear or linear-oblong flat.*

5. **T. gracilis,** *Benth. in Royle Ill.* 197; glabrous, peduncles 1–3-flowered, corolla distinctly exserted, pod linear straight 6–8-seeded.

KASHMIR, KUMAON, GURWHAL, &c., alt. 5–7000 ft.

Stems very slender, trailing, 1–1$\frac{1}{2}$ ft. long. *Stipules* linear, faintly toothed; petiole shorter than leaflets, often scarcely any; leaflets obovate-cuneate, $\frac{1}{4}$–$\frac{1}{2}$ in. long, finely inciso-dentate, veins raised. *Peduncles* filiform, exceeding leaves, ending in a conspicuous awn. *Calyx* $\frac{1}{8}$ in.; teeth setaceous, as long as the tube. *Pod* $\frac{3}{8}$–$\frac{1}{2}$ in. by $\frac{1}{8}$ in., marked with distinct rather close transverse veins.

34469 6. **T. pubescens,** *Edgw. MSS.*; finely downy, peduncles 1–3-flowered, corolla slightly exserted, pod linear-oblong straight 10–12-seeded.

HAZARA, KASHMIR, KUMAON, PITI, KUNAWAR, &c., alt. 5–10,000 ft.

Stems more branched and stouter than in the last, reaching 1 ft. or more long. *Stipules* linear, faintly toothed; petiole shorter than the blade; leaflets obovate-oblong, cuneate at the base, distinctly inciso-dentate, $\frac{1}{2}$–$\frac{3}{4}$ in. long. *Peduncle* as long as the leaves, not ending in an awn. *Calyx* $\frac{1}{8}$ in., finely downy; teeth linear-setaceous, exceeding the tube. *Pod* downy at first, $\frac{1}{2}$–$\frac{5}{8}$ in. by $\frac{1}{6}$–$\frac{1}{5}$ in.; veins transverse, distinct, very close.

7. **T. emodi,** *Benth. in Royle Ill.* 197; flowers 4–6 rarely up to 12 closely racemose, corolla 2–3 times the calyx, pod linear-oblong straight 4–6-seeded. Melilotus emodi, *Wall. Cat.* 5941. Trigonella himalaica, *Wall. MSS.* T. cachemiriana, *Camb. in Jacq. Voy. Bot.* 36, t. 41. Botryolotus cachemyrianus, *Jaub. & Spach. Illust.* i. 125. T. rhytidocarpa, *Boiss. &; Bal. Fl. Orient.* ii. 78.

KASHMIR to NIPAL, alt. 4–10,000 ft.—DISTRIB. Afghanistan, Persia, Orient.

Habit and inflorescence of *T. corniculata*, from which it mainly differs in pod. *Stems* glabrous, copiously branched, 1 ft. or more high. *Stipules* slightly inciso-dentate, points linear-setaceous; leaflets obovate, distinctly inciso-dentate in the wild form. *Peduncles* 1–2 in. long, terminated by a distinct point. *Calyx* glabrous, $\frac{1}{8}$–$\frac{1}{6}$ in.; teeth linear, as long as the tube. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. by $\frac{1}{6}$–$\frac{1}{5}$ in., glabrous, with close distinct raised veins.

8. **T. corniculata,** *Linn.*; *DC. Prodr.* ii. 184; flowers 6–12 closely racemose, corolla 2–3 times the calyx, pod narrow linear falcately recurved 4–8-seeded. *Roxb. Fl. Ind.* iii. 389; *W. & A. Prodr.* 196; *Wight Ic.* t. 384; *Sibth. & Sm. Fl. Græca*, t. 761; *Boiss. Fl. Orient.* ii. 83. T. elatior, *Sibth. & Sm. Fl. Græca*, t. 762. T. fimbriata, *Royle Ill.* 197. T. esculenta, *Willd.*; *DC. Prodr.* ii. 185; *Wall. Cat.* 5985.

BENGAL, KASHMIR and LADAK to KUMAON, alt. 5–12,000 ft.—DISTRIB. Afghanistan, Orient, South Europe.

Diffuse, very much branched, glabrous, suberect, 1 ft. or more high. *Stipules* deeply or faintly toothed, points setaceous; petiole as long as or exceeding leaflets; leaflets obovate-cuneate, faintly inciso-dentate, $\frac{1}{4}$–$\frac{3}{4}$ in. long. *Peduncles* exceeding the leaves, awned at the tip. *Calyx* $\frac{1}{8}$ in.; teeth shorter than the tube. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. by $\frac{1}{8}$ in., glabrous, marked with close transverse raised veins.

13. **MELILOTUS,** Juss.

Annual or biennial herb. *Leaves* with toothed pinnately 3-foliolate leaflets. *Flowers* in long racemes. *Calyx*-tube campanulate; teeth 5, subequal, lanceolate. *Corolla* caducous, free from the staminal tube; standard and wings narrow; keel straight, obtuse. *Stamens* diadelphous, filaments not dilated; anthers uniform. *Ovary* sessile or stipitate, few-ovuled; style filiform, glabrous, much incurved, stigma terminal. *Pod* oblong, much exserted, indehiscent.—DISTRIB. Species about a dozen; spread through the temperate regions of the Old World.

1. **M. parviflora,** *Desf.*; *DC. Prodr.* ii. 187; annual, corolla pale yellow minute, standard exceeding wings and keel, pod glabrous. *Wall. Cat.* 5943 A, B.; *W. & A. Prodr.* 196; *Boiss. Fl. Orient.* ii. 108. M. indica, *All. Fl. Ped.* i. 308. M. minima, *Roth*; *DC. Prodr.* ii. 189. Trifolium indicum, *Linn.*; *Roxb. Fl. Ind.* iii. 388.

WESTERN PENINSULA, BENGAL, NORTH WEST PROVINCES, tropical zone.—DISTRIB. Orient, Europe, and introduced in many other regions.

Stems slender, 1–1$\frac{1}{2}$ ft. high. *Stipules* linear acuminate; leaflets obovate or oblanceolate, retuse or emarginate. *Flowering-racemes* close; fruiting-racemes 1–2 in. *Calyx* $\frac{1}{24}$ in.; teeth deltoid. *Corolla* not more than $\frac{1}{12}$ in. long. *Pod* $\frac{1}{12}$–$\frac{1}{8}$ in., obscurely reticulato-lacunose, usually 1-seeded.—*M. parviflora, Wall.* 5943 D, is *M. italica, Lam.*, only known in India in cultivation.

2. **M. alba,** *Lamk. Dict.* iv. 63; biennial, corolla white, standard exceeding wings and keel, pod glabrous. *Boiss. Fl. Orient.* ii. 109. M. altissima, *Wall. Cat.* 5942, *non Thuill.* M. leucantha, *Koch*; *DC. Prodr.* ii. 187; *W. & A. Prodr.* 196. M. vulgaris, *Willd. Enum.* 490.

Northern Provinces, ascending from the plains of BENGAL to 12–13,000 ft. in NUBRA, and 11,000 ft. in LADAK.—DISTRIB. Europe, Orient, Siberia, &c.

Much taller and more robust than the last. *Stipules* and leaflets similar. *Racemes* in flower 1$\frac{1}{2}$–2 in., in fruit 3–4 in. long. *Calyx* under $\frac{1}{12}$ in.; teeth lanceolate, shorter than the tube. *Corolla* always white, inodorous, 2–3 times the length of the calyx in the temperate zone, nearly as small as in *M. parviflora* in the plains. *Pod* as in the last, but larger, often 2-seeded.

3. **M. officinalis,** *Willd.*; *DC. Prodr.* ii. 186; biennial, corolla yellow, standard the same length as the wings and keel, pod hairy. *Boiss. Fl. Orient.* ii. 109. M. macrorhiza, *Pers.*; *DC. Prodr.* ii. 187. M. altissima, *Thuill. Fl. Par.* 378, *non Wallich.* Trifolium officinale, *Willd.*; *Roxb. Fl. Ind.* iii. 388.

NUBRA and LADAK: 10–13,000 ft., *Thomson, Stewart.*—DISTRIB. Europe, Orient, &c.

Very like *M. alba* in general habit and identical in stipules and leaflets. *Racemes* denser, and not quite so long. *Calyx* $\frac{1}{12}$ in.; teeth lanceolate, as long as the tube. *Corolla* linear, yellow, odorous, usually three times as long as the calyx. *Pod* distinctly stipitate, $\frac{1}{8}$ in. long, 1–2-seeded, not so obtuse.

14. **MEDICAGO,** Linn.

Herbs, rarely shrubs. *Leaves* pinnately 3-foliolate; leaflets toothed. *Calyx*-tube campanulate; teeth 5, subequal. *Corolla* more or less exserted, free

from the staminal tube; standard and wings oblong; keel straight, obtuse. *Stamens* diadelphous; filaments filiform; anthers uniform. *Ovary* sessile, usually many-ovuled; style short, little incurved; stigma oblique. *Pod* usually spirally twisted, many-seeded, indehiscent, rarely sickle-shaped, in *M. lupulina* one-seeded.—DISTRIB. Species about 40; spread principally round the Mediterranean.

M. SATIVA, *Linn.*; *Wall. Cat.* 5945, A, B, probably a cultivated race of *M. falcata*, characterised by the pod forming a double spiral and flowers usually purple, is often grown for forage in Madras, Bengal, and the North-West Provinces.

* *Suberect, perennial.*

1. **M. falcata**, *Linn.*; *DC. Prodr.* ii. 172; *Boiss. Fl. Orient.* ii. 93. M. sativa, *Wall. Cat.* 5945 C, D. M. procumbens, *Besser, Prim. Fl. Gal.* ii. 127.

KASHMIR, LADAK, KUNAWAR, &c.; alt. 5–13,000 ft.—DISTRIB. Affghanistan, Orient, and all through Europe.

Subglabrous, copiously branched, 1–2 ft. high. *Leaflets* oblanceolate, $\frac{1}{2}$–1 in. long. *Peduncles* exceeding leaves. *Flowers* 12–20, in close racemes. *Calyx* $\frac{1}{6}$ in.; teeth setaceous, as long as the tube. *Corolla* bright yellow, twice the calyx. *Pod* linear, sickle-shaped, glabrous, $\frac{1}{2}$–$\frac{3}{4}$ in. long, 5–10-seeded.

** *Diffuse trailing annuals or biennials.*

2. **M. lupulina**, *Linn.*; *DC. Prodr.* ii. 172; biennial, pod minute linear sickle-shaped unarmed one-seeded. *Wall. Cat.* 5944; *Boiss. Fl. Orient.* ii. 105.

Tropical and temperate tracts of the north-west, ascending from the INDUS valley and GANGETIC plain to 10–12,000 ft.—DISTRIB. Orient, Siberia, Europe, Abyssinia, often cultivated.

Stem 1 ft. or more long, finely downy. *Stipules* toothed; points lanceolate, acuminate; leaflets obovate, faintly inciso-crenate, base deltoid, entire. *Flowers* 12–20, densely capitate; peduncles exceeding the leaves. *Calyx* $\frac{1}{24}$ in.; teeth setaceous, as long as the tube. *Corolla* slightly exserted. *Pod* $\frac{1}{12}$ in. long, indehiscent, glabrous or downy, faintly veined longitudinally, finally black.

3. **M. orbicularis**, *All.*; *DC. Prodr.* ii. 174; annual, pod spiral unarmed large vertically compressed. *Boiss. Fl. Orient.* ii. 97.

KASHMIR; temperate region, *Falconer.*—DISTRIB. Orient, Mediterranean, Abyssinia.

Stems slender, subglabrous, a foot or more long. *Stipules* short, deeply laciniated; leaflets $\frac{1}{2}$–$\frac{3}{4}$ in. long, obovate-cuneate, faintly inciso-dentate. *Peduncles* shorter than the leaves, 1–3-flowered. *Calyx* $\frac{1}{8}$ in.; teeth linear-setaceous. *Corolla* yellow, much exserted. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. broad, with 4–5 flattened spirals, distantly finely transversely veined.

4. **M. laciniata**, *All.*; *DC. Prodr.* ii. 180; annual, stipules laciniated, pod small subglobose spiral muricated, corolla scarcely exserted. *Boiss. Fl. Orient.* ii. 104.

PUNJAB; tropical region, *Fleming, Jacquemont, Aitchison.*—DISTRIB. Orient, Mediterranean, Abyssinia.

Stems glabrous, very slender, reaching a foot long. *Leaflets* $\frac{1}{4}$–$\frac{3}{8}$ in. long, obovate-cuneate, sharply inciso-dentate or even pinnatifid; petiole equalling or exceeding leaflets. *Peduncles* filiform, awned, 1–2-flowered. *Calyx* narrowly turbinate, $\frac{1}{8}$ in.; teeth setaceous. *Pod* $\frac{1}{8}$ in. broad with 4–5 sharply muricated spirals.

5. **M. denticulata**, *Willd.*; *DC. Prodr.* ii. 176; annual, stipules laciniated, corolla twice the calyx, pod subglobose spiral muricated. *Boiss. Fl. Orient.* ii. 102. M. canescens, *Grah. in Wall. Cat.* 5946. M. polymorpha, *Roxb. Fl. Ind.* iii. 390.

Tropical zone of the north-west: SCINDE, BENGAL, OUDE, PUNJAB, KUMAON, &c.—DISTRIB. Orient, Abyssinia, Europe, Japan, China, Siberia.

Stems subglabrous, more robust than in *M. minima* and *laciniata*. *Leaflets* $\frac{1}{2}$–$\frac{3}{4}$ in. long, obovate-cuneate, faintly toothed. *Peduncles* short, closely 2–6-flowered, not awned. *Calyx* $\frac{1}{12}$ in.; teeth lanceolate, as long as the tube. *Pod* with 2–4 spirals, the veined face $\frac{1}{6}$–$\frac{1}{4}$ in. broad without the spines, which are $\frac{1}{12}$–$\frac{1}{8}$ in. long in the type, but reduced down to mere tubercles in the var. *M. apiculata*, Willd.

6. **M. minima,** *Lamk.*; *DC. Prodr.* ii. 178; annual, stipules subentire, pod small subglobose spiral muricated. *Boiss. Fl. Orient.* ii. 103.

KASHMIR, alt. 5–6000 ft., *D. Thomson.*—DISTRIB. Afghanistan, Orient, Mediterranean, Abyssinia, Europe.

Finely downy, the *stems* under $\frac{1}{2}$ ft. long. *Petioles* as long as the leaflets, which are obovate-cuneate, $\frac{1}{4}$–$\frac{3}{8}$ in. long, distinctly toothed. *Peduncles* as long as the leaves, closely 2–5-flowered, not mucronate. *Calyx* $\frac{1}{12}$ in., finely downy; teeth linear-setaceous, as long as the tube. *Corolla* distinctly exserted. *Pod* $\frac{1}{8}$ in. broad, exclusive of the long spines, formed of 4–5 close spirals.

15. LOTUS, Linn.

Herbs. *Leaves* usually 5-foliate, the lowest pair of leaflets arising from the base of the petiole like stipules. *Calyx* tube campanulate, teeth subequal. *Corolla* caducous, free from the staminal tube; standard obovate clawed, exceeding the wings and incurved shortly beaked keel. *Stamens* diadelphous, filaments dilated at the apex; anthers uniform. *Ovary* sessile, many-ovuled; style long, abruptly inflexed, stigma terminal. *Pod* linear, turgid, septate between the seeds.—DISTRIB. Species 50 or more, spread through North and South temperate regions.

L. major, Scop. is in Bellew's Kashgar collection.

1. **L. corniculatus,** *Linn.*; *DC. Prodr.* ii. 214; herbaceous, leaflets 5, upper 3 remote from lower 2, flowers in peduncled terminal umbels. *Boiss. Fl. Orient.* ii. 165. L. bracteatus, *Wall. Cat.* 5939.

WEST HIMALAYAS, as far east as NIPAL, principally in the temperate zone up to 10,000 ft., but descending into the plains.—DISTRIB. Europe, Orient, Abyssinia, Japan, Australia.

Perennial. *Stems* slender, glabrous or obscurely silky. *Leaflets* 5, the end one sessile and two lowest stipule like. *Flowers* 4–8 in a close umbel, subtended by a reduced trifoliolate leaf, at the end of a long peduncle. *Calyx* $\frac{1}{4}$ in.; teeth lanceolate-cuspidate. *Corolla* showy, 2–3 times as long as the calyx. *Pod* cylindrical, straight, $\frac{3}{4}$–1 in. long.

VAR. *minor*; a dwarf form, from the plains of Scinde with solitary flowers and fleshy leaflets $\frac{1}{8}$ in. long.

2. **L.? Garcini,** *DC. Prodr.* ii. 212; suffruticose, leaflets 3 all sessile rarely 5, flowers sessile axillary solitary. *Boiss. Fl. Orient.* ii. 174. Ononis Aucheri, *Jaub. & Spach Ill. Pl. Orient*, t. 96. L. Stocksii, *Boiss. Fl. Orient.* ii. 174.

SCINDE in sandy ground near the sea, *Stocks.*—DISTRIB. Through Persia to Nubia.
Habit less like that of a *Lotus* than of an *Ononis*, to which genus it also approaches by its slightly dimorphous anthers. *Stems* $\frac{1}{2}$–1 ft., copiously stiffly branched, covered like the leaves with short grey tomentum. *Leaflets* pale, fleshy, $\frac{1}{4}$–$\frac{3}{8}$ in. long, obovate-cuneate. *Flowers* copious, inconspicuous. *Calyx* $\frac{1}{4}$ in., densely downy; teeth linear, twice the tube. *Corolla* not exserted. *Pod* linear, straight, 5–6-seeded, $\frac{3}{8}$–$\frac{1}{2}$ in. long.

16. CYAMOPSIS, DC.

Erect annuals, with 3-foliolate leaves, laterally attached hairs and small purplish flowers in axillary racemes. *Calyx*-tube oblique; teeth unequal, the lowest elongated, setaceous. *Petals* caducous: standard and wings narrow; keel obtuse, slightly incurved. *Stamens* monadelphous; anthers uniform, apiculate. *Ovary* sessile, linear, 6–8-ovuled; style short, filiform, much incurved, stigma capitate. *Pod* linear, straight, subtetragonous, 2-valved, septate between the seeds.—DISTRIB. Species 2, the other Arabian and trop. African.

1. **C. psoralioides,** *DC. Prodr.* ii. 216; *Wall. Cat.* 5920; *W. & A. Prodr.* 197; *Wight Ic.* t. 248. Psoralea tetragonoloba, *Linn. Mant.* 104. Lupinus trifoliatus, *Cav. Ic.* t. 59. Dolichos psoraloides, *Lamk. Dict.* ii. 300. D. fabæformis, *L'Herit.*; *Roxb. Fl. Ind.* iii. 316.

Plains from the HIMALAYA to the WESTERN PENINSULA, but often, perhaps always, cultivated.—DISTRIB. Afghanistan.

A robust, erect annual, 2–3 ft. high, clothed with adpressed grey hairs attached by the middle, as in *Indigofera*. *Stipules* long, linear-setaceous; *leaves* petioled, 3-foliolate; leaflets ovate, acute, inciso-dentate, 2–3 in. long. *Flowers* 6–30 in copious close short-peduncled axillary racemes; bracts setaceous, protruded. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in. *Corolla* scarcely exserted. *Pod* thick, fleshy, straight, 1$\frac{1}{2}$–2 in. long.

17. INDIGOFERA, Linn.

Herbs or shrubs clothed more or less densely with adpressed hairs laterally attached, often silvery-canescent. *Flowers* in copious axillary racemes. *Calyx* minute, campanulate; teeth 5, subequal or the lowest longest. *Corolla* caducous; standard obovate; keel straight, not rostrate, spurred on each side near the base. *Stamens* diadelphous; anthers uniform, apiculate. *Ovary* sessile, usually many-ovuled; style short incurved, stigma capitate usually penicillate. *Pod* usually linear-cylindrical, rarely oblong or globose, turgid, rarely flattish, in one section crescent-shaped, densely muricated.—DISTRIB. Species 250–300, spread through all tropical regions and also abundant at the Cape.

SUBGEN. 1. **Acanthonotus,** *Benth.* *Pod* recurved, sickle-shaped, 1-seeded, muricated along the ventral suture.

1. **I. echinata,** *Willd.*; *DC. Prodr.* ii. 222; *Roxb. Hort. Beng.* 98; *Fl. Ind.* iii. 370; *Wall. Cat.* 5456; *W. & A. Prodr.* 198; *Wight Ic.* t. 316; *Dalz. & Gibs. Bomb. Fl.* 57. Hedysarum nummularifolium, *Linn. Sp. Pl.* 1051 (*excl. syn.*). H. rotundifolium, *Vahl Symb.* ii. 81. H. erinaceum, *Poir. Dict. Suppl.* vi. 393. Onobrychis rotundifolia, *Desv.*; *DC. Prodr.* ii. 348. O. cuneifolia, *DC. Prodr.* ii. 348. Indigofera prostrata, *Roxb. MSS.*

Plains of CEYLON and the WESTERN PENINSULA.—DISTRIB. Guinea.

A diffuse much-branched *annual* with stems 1–2 ft. long. *Leaves* simple, nearly sessile, broad-obovate, obtuse, mucronate, glabrescent, membranous, $\frac{1}{2}$–$\frac{3}{4}$ in. long; stipules linear-setaceous. *Racemes* copious, short-peduncled, 6–10-flowered. *Calyx* $\frac{1}{12}$ in.; teeth setaceous, very long. *Corolla* pinkish, $\frac{1}{8}$ in. *Pod* under $\frac{1}{4}$ in. long, laterally flattened, beaked with the persistent style.

SUBGEN. 2. **Sphæridiophora,** Desv. *Pod* minute, unarmed, globose, 1-seeded.

2. **I. linifolia,** *Retz*; *DC. Prodr.* ii. 222; *Roxb. Fl. Ind.* iii. 370; *Cor. Pl.* t. 196; *Wall. Cat.* 5489; *W. & A. Prodr.* 198; *Wight Ic.* t. 313; *Dalz. & Gibs. Bomb. Fl.* 58; *Boiss. Fl. Orient.* ii. 188. Sphæridiophora linifolium, *Desv. Journ. Bot.* iii. 125, t. 6, fig. 35. S. abyssinicum, *Jaub. et Spach. Ill.* t. 494.

Throughout India from the HIMALAYAS to CEYLON, common.—DISTRIB. Abyssinia, Afghanistan, Malay Isles, N. Australia.

Annual, the whole plant persistently silvery-hoary. *Stems* slender, copiously branched both at the base and upwards, $\frac{1}{2}$–1 ft. *Leaves* simple, subsessile, $\frac{1}{2}$–1 in. long, typically linear, acute, but varying (var. *Campbellii*, Wight) to obovate, obtuse with a mucro; stipules minute, setaceous. *Flowers* 6–12 in copious dense subsessile racemes. *Calyx* $\frac{1}{12}$ in., silvery; teeth long, linear-setaceous. *Corolla* bright red, 2–3 times the calyx. *Pod* hard, mucronate, silvery, under $\frac{1}{12}$ in. thick.

SUBGEN. 3. **Euindigofera,** *Benth.* *Ovary* with at least 2 ovules, usually with many. *Pod* linear or oblong, unarmed, turgid.

Group 1. *Simplicifoliæ.* *Leaves* simple (in Sp. 6 casually 3-folioliate.)

3. **I. cordifolia,** *Heyne*; *DC. Prodr.* ii. 222; herbaceous, loosely pubescent, leaves subsessile cordate-ovate, flowers in dense sessile heads, pod oblong 2-seeded. *W. & A. Prodr.* 199; *Dalz. & Gibs. Bomb. Fl.* 58. Heylandia ? cordifolia, *Grah. in Wall. Cat.* 5343.

Plains throughout India proper, ascending to 4000 ft. in the Chenab valley.—DISTRIB. Afghanistan, Beloochistan, Nubia, Malay Isles, N. Australia.

A copiously branched diffuse *annual* with stems $\frac{1}{4}$–$\frac{3}{4}$ ft. long. *Leaves* subobtuse with a mucro, flexuous, $\frac{1}{2}$–$\frac{3}{4}$ in. long, obscurely downy above, densely below; stipules setaceous, minute. *Heads* copious, 4–8-flowered. *Calyx* $\frac{1}{8}$ in. densely downy; teeth long, setaceous. *Corolla* bright red, not exserted. *Pod* under $\frac{1}{4}$ in. long, pubescent, casually 1-seeded.

4. **I. triquetra,** *Dalz. in Hook. Kew Journ.* ii. 36; herbaceous, thinly argenteo-canescent, leaves subsessile oblong, flowers 6–12 in small peduncled racemes, pod linear 4–6-seeded. *Dalz. & Gibs. Bomb. Flora*, 58.

Plains of CONCAN, *Dalzell, Stocks.*

Perennial, greenish in shade, obscurely silvery in exposure. *Stems* very flexuous, trailing, 1 ft. or less long, slender, acutely triquetrous. *Leaves* firm, $\frac{1}{2}$–$\frac{3}{4}$ in. long, narrowed or slightly rounded at both ends; stipules setaceous, persistent. *Racemes* short-peduncled, finally an inch long. *Calyx* $\frac{1}{12}$ in., canescent; teeth long, setaceous. *Corolla* $\frac{1}{8}$ in., bright red. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. long, turgid, glabrous, the flattened sutures margined by acute keels.

5. **I. caloneura,** *Kurz in Journ. Asiat. Soc. Beng.* 42, 2, 229; shrubby, fulvo-puberulous, leaves small petioled elliptical with veins beneath much raised, racemes short close, pods unknown.

PEGU, *Kurz.*

An erect branched shrub. *Leaves* $\frac{1}{4}$–$\frac{1}{3}$ in., rounded to both ends, mucronulate, chartaceous, glabrous above, glaucescent and softly pubescent below; petiole as long as blade; stipules minute, linear-subulate. *Racemes* usually shorter than leaves; peduncle $\frac{1}{6}$ in.; bracts subulate, moderately long. *Calyx* broad, short. *Corolla* $\frac{1}{3}$ in., probably rose. *Ovary* densely silky.

6. **I. Brunoniana,** *Grah. in Wall. Cat.* 5491; shrubby, argenteo-canescent, leaves large petioled oblong, racemes close elongated, pods cylindrical many-seeded. *Wall. Pl. As. Rar.* t. 279.

BIRMA, Mount Prome, *Wallich.*

Branches long, virgate, terete, slender. *Leaves* oblong, casually 3-foliolate, firm, conspicuously veined below, 3–5 in. long, obtuse or subacute; stipules deciduous; petioles $\frac{1}{4}$–$\frac{1}{2}$ in. *Racemes* short-peduncled, copious, reaching 4–5 in. long. *Calyx* oblique, argenteo-canescent, $\frac{1}{12}$ in. long; teeth short, deltoid. *Corolla* $\frac{3}{8}$ in., bright red; standard thinly canescent. *Pod* turgid, 2 in. long, thinly canescent, recurved at the tip.

Group 2. *Sessilifloræ.* *Leaves* odd-pinnate. *Flowers* in dense sessile or short-peduncled heads. *Pods* short, few-seeded.

7. **I. glandulosa,** *Willd.*; *DC. Prodr.* ii. 223; thinly pubescent, not at all argenteo-canescent, leaves distinctly petioled always 3-foliolate, corolla 3–4 times the calyx, pod 1–2-seeded. *Roxb. Fl. Ind.* iii. 372; *Wall. Cat.* 5461; *W. & A. Prodr.* 199; *Wight Ic.* t. 330; *Dalz. & Gibs. Bomb. Fl.* 58. I. frumentacea, *Roxb. MSS.*

Plains of WESTERN PENINSULA and BUNDELKUND.

Annual, with elongated slender branches clothed when young with spreading hairs. *Stipules* setaceous, minute; petiole nearly as long as the leaflets; leaflets oblanceolate, membranous, $\frac{1}{2}$–1 in. long, green above, hairs adpressed obscure, pale glaucous with copious distinct black dots below. *Heads* $\frac{1}{4}$–$\frac{3}{8}$ in. long, sessile. *Calyx* $\frac{1}{12}$ in., pubescent; teeth long, setaceous. *Pod* brown, finely pubescent, oblong, $\frac{1}{6}$ in. long, the sutures often dentate, in var. *I. Sykesii*, Herb. Griff., globose, 1-seeded.

8. **I. trigonelloides,** *Jaub. & Spach.' Illust.* t. 482; densely silvery, leaves distinctly petioled 5-7-foliolate, corolla scarcely exserted, pod linear 3-4-seeded. I. asperifolia, *Hochst. in Schimp. Pl. Abyss.* No. 2272. I. æruginis, *Schweinf. Fl. Æthiop.* 11.

Plains of SCINDE, *Stocks.*—DISTRIB. Afghanistan, Abyssinia.

Annual; *stems* cæspitose, trailing, much branched, $\frac{1}{2}$–1 ft. long. *Leaves* $\frac{1}{2}$–1 in. long; leaflets firm, alternate, oblanceolate; stipules linear; petiole $\frac{1}{4}$–$\frac{3}{8}$ in. *Heads* copious, always sessile, round or oblong, 12–20 flowered. *Calyx* $\frac{1}{8}$ in.; teeth long, setaceous. *Corolla* red. *Pod* $\frac{1}{4}$ in. long, cylindrical, silvery-hoary, torulose.

9. **I. enneaphylla,** *Linn.*; *DC. Prodr.* ii. 229; thinly silvery-hoary, leaves nearly sessile 7–11-foliolate, corolla slightly exserted, pod oblong 2-seeded. *Roxb. Fl. Ind.* iii. 376; *Wall. Cat.* 5444; *W. & A. Prodr.* 199; *Wight Ic.* t. 403; *Dalz. & Gibs. Bomb. Fl.* 58. I. cæspitosa, *Wight in Wall. Cat.* 5447. Hedysarum prostratum, *Linn. Mant.* i. 102; *Burm. Fl. Ind.* t. 55, fig. 1.

Plains of India from the HIMALAYAS (where it ascends to 4000 ft.) to CEYLON and BIRMA.—DISTRIB. Angola, Malay isles, North Australia.

Annual or biennial. *Stems* densely cæspitose, 1–1$\frac{1}{2}$ ft., trailing, much branched. *Leaves* $\frac{1}{2}$–1$\frac{1}{2}$ in. long; leaflets firm, oblanceolate, alternate; stipules minute, setaceous. *Heads* 12–20-flowered, dense, short-peduncled or sessile. *Calyx* $\frac{1}{12}$–$\frac{1}{8}$ in., hoary; teeth long, setaceous. *Pod* $\frac{1}{8}$–$\frac{1}{6}$ in. long, cylindrical, thinly hoary.

Group 3. *Digitatæ.* *Leaves* digitate or nearly so, rarely 1-foliolate, sessile. *Flowers* solitary, pedicellate.

10. **I. uniflora,** *Hamilt. MSS.*; herbaceous, branches very slender, pedicels exceding the leaves as long as the pod. *Roxb. Fl. Ind.* iii. 374; *Wall. Cat.* 5446; *W. & A. Prodr.* 199; *Wight Ic.* t. 333; *Dalz. & Gibs. Bomb. Fl.* 58.

Plains of the WESTERN PENINSULA and CARNATIC.

Perennial. *Stems* herbaceous, very slender, copiously branched, 1–1$\frac{1}{2}$ ft. long. *Stipules* setaceous, very minute; leaflets 3–7, rarely 1, narrow, oblanceolate, subobtuse or subacute, $\frac{1}{8}$–$\frac{3}{8}$ in. long, pale green, membranous, with a few obscure adpressed hairs, not always perfectly digitate. *Pedicels* filiform, $\frac{3}{8}$–$\frac{1}{2}$ in. *Calyx* scarcely $\frac{1}{24}$ in.; teeth long, linear. *Corolla* red, $\frac{1}{8}$ in. *Pod* glabrous, straight, linear, $\frac{3}{8}$–$\frac{1}{2}$ in. long, 4–7-seeded.

11. **I. aspalathoides,** *Vahl*; *DC. Prodr.* ii. 231; shrubby, branches woody rigid, pedicels as long as the leaves much shorter than the pod. *W. & A. Prodr.* 199; *Wight Ic.* t. 332; *Hook. Ic.* t. 188; *Dalz. & Gibs. Bomb. Fl.* 58. I. aspalathifolia, *Roxb. Hort. Beng.* 98; *Fl. Ind.* iii. 371; *Wall. Cat.* 5445. Aspalathus indicus, *Linn. Sp. Plant.* 1001. Lespedeza juncea, *Wall. Cat.* 5743, B—*Rheede Hort. Mal.* ix. t. 37.

Plains of CARNATIC and CEYLON.

A low *undershrub*, with copiously spreading rigid terete branches and argenteo-canescent branchlets. *Leaflets* 1–5, pale green, with a few obscure adpressed hairs, oblançeolate, $\frac{1}{12}$–$\frac{1}{4}$ in. long, often complicate. *Pedicels* erecto-patent, $\frac{1}{8}$–$\frac{1}{4}$ in. *Calyx* and corolla like that of *I. uniflora*. *Pod* straight, glabrous, turgid, $\frac{1}{2}$–$\frac{5}{8}$ in. long. 6–8-seeded.

Group 4. *Dissitifloræ*. *Leaves* odd-pinnate. *Flowers* few together, in lax short-peduncled racemes.

12. **I. pentaphylla,** *Linn.*; *DC. Prodr.* ii. 230; branches with only a few spreading deciduous glandless hairs, leaflets 5 obovate, racemes 2–4-flowered, pods glabrous. *W. & A. Prodr.* 200; *Wight Ic.* t. 385, *non Burch.* I. glabra, *Linn.*; *DC. Prodr.* ii. 229. I. fragrans, *Retz.*; *DC. Prodr. loc. cit.*; *Roxb. Fl. Ind.* iii. 375; *Wall. Cat.* 5452.

Plains throughout India Proper from the HIMALAYAS to CEYLON.—DISTRIB. Trop. Africa.

Annual, densely cæspitose; branches firm, very slender, a foot or more long. *Leaves* short-petioled, $\frac{3}{4}$–1 in. long; leaflets opposite, membranous, pale, glaucous below, with a few adpressed bristly hairs; stipules setaceous, persistent. *Calyx* $\frac{1}{12}$ in. long; teeth long, setaceous. *Corolla* $\frac{1}{8}$ in., bright red. *Pod* turgid, straight, $\frac{5}{8}$–$\frac{3}{4}$ in. long, 8–12-seeded, not at all torulose.

13. **I. tenuifolia,** *Rottl.*; *W. & A. Prodr.* 200; branches and pod with only a few adpressed hairs, leaflets 7–9 oblanceolate, racemes 3–6-flowered. *Dalz. & Gibs. Bomb. Fl.* 58.

Plains of the WESTERN PENINSULA and CEYLON.

General habit of *I. pentaphylla*, which it approaches closely. *Leaves* $\frac{3}{4}$–1 in. long, short-petioled; leaflets opposite, firmer than in the last and much narrower, with numerous adpressed hairs on both sides; stipules setaceous, very minute. *Racemes* short-peduncled, equalling or slightly exceeding the leaves. *Calyx* and corolla as in *I. pentaphylla*. *Pod* straight, cylindrical, $\frac{3}{4}$–1 in. long, 8–10-seeded, distinctly torulose.

14. **I. viscosa,** *Lamk.*; *DC. Prodr.* ii. 227; branches and pod densely clothed with minute gland-tipped hairs, leaflets 7–9 oblanceolate, racemes 6–12-flowered. *Roxb. Fl. Ind.* iii. 377; *W. & A. Prodr.* 200; *Wight Ic.* t. 404; *Wall. Cat.* 5451; *Boiss. Fl. Orient.* ii. 189. I. glutinosa, *Perott.*; *DC. Prodr. loc. cit.* I. lateritia, *Willd.*; *DC. Prodr. loc. cit.* I. graveolens and glutinosa, *Roxb. MSS.* Galega Colutea, *Burm. Fl. Ind.* 172.

Plains of India from the HIMALAYAS to CEYLON; BIRMA.—DISTRIB. Trop. Africa, Afghanistan, Malay isles, North Australia.

Branches densely cæspitose, 1–3 ft. high, more robust and woody than in the two last, persistently densely viscous throughout. *Leaves* $\frac{3}{4}$–$1\frac{1}{2}$ in. long; leaflets membranous, opposite, pale green above, very glaucous below, with persistent adpressed bristly hairs; stipules setaceous, minute; petiole $\frac{1}{2}$ in. long, viscous like the branches. *Racemes* short-peduncled, about as long as the leaves. *Calyx* and corolla as in the two last. *Pod* straight, $\frac{3}{4}$–1 in. long, 10–12-seeded, faintly torulose.

15. **I. pedicellata,** *W. & A. Prodr.* 200; branches and pod glabrescent, leaflets 3 oblanceolate-oblong, racemes 6–12-flowered. *Wight Ic.* t. 983.

NILGHIRIS and PULNEY hills.

Perennial. *Branches* trailing, firm, very slender, a foot or more long, faintly pubescent when young. *Stipules* linear, minute; petiole shorter than the leaflets; leaflets firm, $\frac{3}{8}$–$\frac{1}{2}$ in. long, with a few adpressed grey hairs on both sides, and black sessile glands below, the end one subsessile. *Racemes* $\frac{1}{2}$–1 in. long, 6–12-flowered; pedicels 2–3 times the calyx, with distinct linear bracteoles. *Calyx* $\frac{1}{12}$ in., shortly pubescent; teeth long, setaceous. *Corolla* red, twice the calyx. *Pod* straight, $\frac{5}{8}$–$\frac{3}{4}$ in. long, many-seeded, obscurely pubescent at first, not at all torulose.

Group 5. *Tinctoriæ.* *Leaves* odd-pinnate. *Racemes* many-flowered, usually peduncled. *Pods* linear, usually many-seeded.

* *Leaflets* 3–5.

16. **I. trifoliata,** *Linn.*; *DC. Prodr.* ii. 223; suffruticose, branches and membranous leaves thinly clothed with adpressed hairs, racemes sessile congested, leaflets 3 the end one sessile, pod straight glabrescent 6–8-seeded. *W. & A. Prodr.* 201; *Wight Ic.* t. 314; *Dalz. & Gibs. Bomb. Fl.* 59. I. prostrata, *Willd.*; *DC. Prodr.* ii. 233; *Roxb. Hort. Beng.* 98; *Fl. Ind.* iii. 373. I. moluccana, *DC. Prodr.* ii. 232. I. multicaulis, *DC. Prodr.* ii. 223. I. canescens, *Grah. in Wall. Cat.* 5448. I. peregrina, *DC. Prodr.* ii. 224. I. orixensis, *Roxb. MSS.* I. adenophylla, *Grah. in Wall. Cat.* 5462. I. congesta, *Grah. in Wall. Cat.* 5471.

HIMALAYAS (ascending to 4000 ft. in Kumaon) to CEYLON, TENASSERIM, *Helfer.*—DISTRIB. Java, China, Philippines, North Australia.

Perennial. Stems copiously branched, trailing or suberect, 1–2 ft. long, soon glabrescent. *Stipules* minute, setaceous; petiole shorter than the leaflets, which are always 3, digitate, oblanceolate, $\frac{1}{2}$–1 in. long, grey-green above, glaucous below with black dots. *Racemes* 6–12-flowered, usually shorter than the petiole. *Calyx* $\frac{1}{24}$ in.; teeth long, setaceous. *Corolla* red, 3–4 times the calyx. *Pod* deflexed, $\frac{1}{2}$–$\frac{5}{8}$ in. long, the sutures acutely bordered, the valves not torulose.

17. **I. vestita,** *Baker*; suffruticose, branches and leaves densely pubescent, leaflets 3 the end one sessile, racemes sessile congested, pod straight pubescent many-seeded.

WESTERN PENINSULA; Pulney hills, *Wight.*

Closely allied to the preceding, differing mainly in pubescence. *Branches* very slender, densely cæspitose, under a foot long, ascending, clothed like the petioles, and leaves with short spreading soft brownish hairs. *Petiole* $\frac{1}{4}$–$\frac{3}{8}$ in.; leaflets crowded, obovate, soft, thick, obtuse, $\frac{1}{2}$–$\frac{3}{4}$ in. long. *Racemes* as in *I. trifoliata. Calyx* densely pubescent, teeth setaceous, plumose. *Pod* clothed with brown pubescence like that of the branches.

18. **I. trita,** *Linn. fil.*; *DC. Prodr.* ii. 232; suffruticose, branches and membranous leaves thinly clothed with adpressed grey hairs, leaflets 3 obovate the end one stalked, racemes congested, pod straight tetragonous 6–10-seeded not torulose. *Roxb. Fl. Ind.* iii. 371; *Don Prodr.* 245; *Hook. Comp. Bot. Mag.* t. 16; *W. & A. Prodr.* 204; *Wall. Cat.* 5449; *Wight Ic.* t. 315, 386; *Dalz. & Gibs. Bomb. Fl.* 60. I. cinerea, *Willd.*; *DC. Prodr.* ii. 232. I. timoriensis, *Willd.*; *DC. Prodr.* ii. 223. I. canescens, *Lamk.*; *DC. Prodr.* 224, *non Wall.* I. hedysaroides, *Lamk.*; *DC. Prodr.* ii. 232. I. arcuata, *Willd.*; *DC. Prodr.* ii. 232. I. rigida, *Willd.*; *DC. Prodr.* ii. 224. I. armata, *Wall. Cat.* 5453. I. argentea, *Wall. Cat.* 5455, *in part.* I. Leschenaultii, *DC. Prodr.* ii. 223. I. ternata, *Roxb. MSS.* I. virgata, *DC. Prodr.* ii. 224, *non Roxb.*

Plains of India from the HIMALAYAS to CEYLON; BIRMA.—DISTRIB. Trop. Africa, Malay isles, North Australia.

An *undershrub*, 2–3 ft. high, with firm slender branches, soon glabrescent. *Stipules* minute, setaceous; petiole $\frac{1}{2}$–$\frac{3}{4}$ in.; leaflets always 3, the end one 1–1$\frac{1}{2}$ in. long, the side ones opposite. *Racemes* 6–12-flowered, usually sessile, seldom over an inch long. *Calyx* $\frac{1}{12}$–$\frac{1}{8}$ in., white-canescent; teeth long, setaceous. *Corolla* purplish-red, twice the calyx. *Pod* deflexed, $\frac{3}{4}$–1$\frac{1}{4}$ in. long, the firm glabrescent valves obtusely keeled.

19. **I. subulata,** *Vahl*; *DC. Prodr.* ii. 232; suffruticose, branches and membranous leaves thinly clothed with adpressed grey hairs, leaflets 5 obovate the side ones opposite, racemes elongated, pod long recurved 10–15-seeded not

torulose. I. mucronata, *Spreng.*; *DC. Prodr.* ii. 227. I. flaccida, *Kœnig.*; *Roxb. Hort. Beng.* 98; *Fl. Ind.* iii. 375; *W. & A. Prodr.* 204; *Wight Ic.* t. 387; *Wall. Cat.* 5475. I. scabra, *Roth*; *DC. Prodr.* ii. 229. I. Thonningii, *Thonn. et Schum. Pl. Guin.* 366.

Plains of the WESTERN PENINSULA and CEYLON.—DISTRIB. Trop. Africa, Trop. America.

Habit and leaflets of *I. trita*, from which it differs in racemes, leaves and pod. *Branches* woody, virgate, soon glabrescent. *Leaflets* thin, glabrescent above, pale below with a few adpressed grey hairs, always 5 on the leaves of the main branches, $\frac{3}{4}$–1 in. long. *Peduncles* 1–2 in. long; racemes 20–40-flowered, reaching 4–6 in. long. *Calyx* $\frac{1}{12}$ in.: teeth setaceous. *Corolla* lilac, 2–3 times the calyx. *Pod* 1–2 in. long, subtetragonal from the raised keel of the valves.

20. **I. marginulata,** *Grah. in Wall. Cat.* 5467; suffruticose, branches and membranous leaves thinly clothed with adpressed grey hairs, leaflets 5 opposite obovate, racemes elongated, pod straight turgid 5–6-seeded. *W. & A. Prodr.* 204.

CONCAN, *Stocks*; Dindygul hills, in the CARNATIC, *Wight.*

General habit of *I. subulata*, from which it scarcely differs, except in pod. *Leaflets* the same in shape, size, and vestiture. *Racemes* lax, short-peduncled, 2–3 in. long, exceeding the leaves. *Pods* deflexed, $\frac{3}{4}$–1 in. long, clothed with minute adpressed deciduous grey hairs, the valves broadly rounded.

21. **I. angulosa,** *Edgew. MSS.*; suffruticose, branches and membranous leaves thinly clothed with adpressed grey hairs, leaflets opposite 5 oblong, racemes elongated, pod short moniliform 1–3-seeded. I. subulata var. angulosa, *Edgew. in Linn. Journ.* ix. 311.

BUNDELKUND, *Edgeworth.*

General habit, leaves and flowers of the two preceding. *Leaflets* 1–1$\frac{1}{2}$ in. long, pale grey-green. *Racemes* peduncled, 30–50-flowered, reaching 4–6 in. long, much exceeding the leaves. *Pod* $\frac{3}{8}$–$\frac{1}{2}$ in. long, deeply constricted between the seeds, with a beak which is gradually narrowed into the style.

22. **I. paucifolia,** *Delile; DC. Prodr.* ii. 224; shrubby, branches and subcoriaceous leaves argenteo-canescent, leaflets 3–5 alternate, pods 6–8-seeded torulose recurved. *Wall. Cat.* 5454; *W. & A. Prodr.* 201; *Wight Ic.* t. 331; *Dalz. & Gibs. Bomb. Fl.* 59; *Boiss. Fl. Orient.* ii. 190. I. argentea, *Roxb. Fl. Ind.* iii. 374; *Wall. Cat.* 5455, *ex parte, non Linn.* I. heterophylla, *Roxb. MSS.*

Plains from SCINDE and the UPPER GANGES to CEYLON.—DISTRIB. Java, Beloochistan, Arabia, Trop. Africa.

A *shrub* reaching 4–6 ft. high, with copious woody branches. *Leaflets* firm, oblanceolate-oblong, $\frac{1}{2}$–1 in. long, sometimes solitary on the branches; petiole short, but distinct. *Racemes* short-peduncled, 20–50-flowered, reaching 3–4 in. long. *Calyx* silvery, $\frac{1}{24}$ in.; teeth lanceolate-cuspidate, as long as the tube. *Corolla* red, 3–4 times the calyx, thinly silvery externally. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. long, glaucous, distinctly torulose.

** *Leaflets many, opposite (except I. endecaphylla); flowers small.*

23. **I. parviflora,** *Heyne*; herbaceous, thinly argenteo-canescent, leaflets 7-9 linear or narrow oblanceolate opposite pod long glabrescent 15–20-seeded recurved at the tip. *Wall. Cat.* 5457; *W. & A. Prodr.* 201. I. linearis, *Guill. & Per. Fl. Seneg.* 184. Indigastrum deflexum, *Jaub. & Spach. Ill.* t. 492.

Plains of the CARNATIC and WEST PENINSULA.—DISTRIB. Arabia, Trop. Africa, N. Australia.

A suberect copiously-branched annual, 1–2 ft. high, with slender finely canescent stems. *Leaves* short-petioled, $1\frac{1}{2}$–2 in. long; leaflets membranous, $\frac{1}{2}$–1 in. long, obtuse or subacute, thinly argenteo-canescent; stipules minute, setaceous. *Racemes* congested, sessile, $\frac{1}{4}$–1 in. long, 6–12-flowered. *Calyx* $\frac{1}{12}$ in.; teeth linear, long. *Corolla* lilac, 2–3 times the calyx. *Pod* 1–$1\frac{1}{4}$ in. long, finely canescent when young.

24. **I. endecaphylla,** *Jacq. Ic.* t. 570; herbaceous, stem and leaves with only a few adpressed hairs, leaflets 5–9 oblanceolate alternate, pod straight glabrescent 6–10-seeded. *DC. Prodr.* ii. 228; *Bot. Reg.* t. 789. I. pusilla, *Lamk.*; *DC. Prodr.* ii. 229? I. Kleinii, *W. & A. Prodr.* 204. I. debilis, *Grah. in Wall. Cat.* 5466. I. anceps, *Vahl.*; *Poir. Dict. Suppl.* iii. 147. I. Schimperiana, *Hochst. in Schimp. Pl. Abyss.* No. 366.

Plains of the WESTERN PENINSULA. BIRMA, *Wallich.*—DISTRIB. Cape, Trop. Africa, Siam, China.

An *annual* or biennial, with trailing stems 1–2 ft. long. *Leaves* nearly sessile, 1–3 in. long; leaflets membranous, obtuse, $\frac{1}{2}$–$\frac{3}{4}$ in. long, with a few adpressed grey hairs; stipules $\frac{1}{4}$–$\frac{1}{3}$ in., lanceolate, acuminate. *Racemes* close, usually peduncled, 1–4 in. long. *Calyx* $\frac{1}{12}$–$\frac{1}{8}$ in.; teeth setaceous, long. *Corolla* violet-purple, twice the calyx. *Pods* deflexed, $\frac{3}{4}$–1 in. long.—If Lamarck's name belong here it has priority.

25. **I. hirsuta,** *Linn.*; *DC. Prodr.* ii. 228; herbaceous, stems densely clothed with short spreading pubescence, leaflets 5–11 opposite large obovate, pod short straight pubescent 6–8-seeded. *Wall. Cat.* 5450; *W. & A. Prodr.* 204; *Roxb. Fl. Ind.* iii. 376; *Jacq. Ic.* t. 569; *Hook. Comp. Bot. Mag.* t. 24. I. fusca, *G. Don, Gen. Syst.* ii. 211. I. ferruginea, *Schum. & Thonn. Pl. Guin.* 370—*Rheede Hort. Mal.* ix. t. 30.

Plains from the HIMALAYAS (ascending to 4500 ft. in KUMAON) to CEYLON, AVA, and TENASSERIM.—DISTRIB. Trop. Africa, Trop. America, Java, Philippines, N. Australia.

Annual or biennial, suberect, reaching 2–4 ft. high, the pubescence grey or brown. *Leaves* short-petioled, 2–5 in. long; leaflets membranous, grey-green, glaucous below, reaching 1–2 in. long, densely coated with adpressed hairs; stipules setaceous, plumose. *Racemes* short-peduncled, very dense, 2–6 in. long. *Calyx* $\frac{1}{8}$ in., densely pubescent; teeth setaceous, long, plumose. *Corolla* red, not much exserted. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. long, densely clothed like the branches.

26. **I. semitrijuga,** *Forsk.*; *DC. Prodr.* ii. 230; suffruticose, densely argenteo-canescent, leaflets opposite small obovate 5–9, pod linear straight 4–6-seeded not torulose.

Plains of SCINDE, *Stocks.*—DISTRIB. Arabia, Egypt, Abyssinia.

A low shrub, diffusely branched from the base. *Leaves* under 1 in. long; leaflets obtuse, $\frac{1}{8}$–$\frac{1}{6}$ in. long, subcoriaceous, sometimes emarginate; stipules minute, setaceous. *Racemes* laxly 6–12-flowered, short-peduncled, usually exceeding the leaves. *Calyx* $\frac{1}{12}$ in., canescent; teeth linear-lanceolate, as long as the tube. *Corolla* twice the calyx, thinly silvery externally. *Pod* $\frac{1}{2}$ in. long, turgid, canescent.

27. **I. argentea,** *Linn.*; *DC. Prodr.* ii. 224; shrubby, densely argenteo-canescent, leaflets large obovate, pod reflexed 3–4-seeded torulose. *L'Her. Stirp.* t. 79; *Boiss. Fl. Orient.* ii. 190, *non Roxb. nec Wall.* I. glauca, *Lamk. Dict.* iii. 246. I. articulata, *Gouan Ill.* 49. I. tinctoria, *Forsk. Egypt.* 138, *non Linn.*

Plains of SCINDE, *Stocks*.—DISTRIB. Arabia, Egypt, Abyssinia.

A shrub several feet high, with sulcate woody branches. *Leaves* 1–2 in. long; leaflets opposite, subcoriaceous, persistently argenteous,, ½–1 in. long; petiole ½ in.; stipules minute, setaceous. *Racemes* subsessile, 12–20-flowered, shorter than the leaves, ½–1 in. long whilst in flower. *Calyx* $\frac{1}{24}$ in., campanulate, argenteous; teeth deltoid, cuspidate, as long as tube. *Corolla* $\frac{1}{6}$ in., reddish-yellow, externally canescent. *Pod* $\frac{3}{8}$–½ in. by $\frac{1}{6}$ in., at first argenteous, finally glabrescent, distinctly torulose.

VAR. *cærulea*; leaves 2–3 in. long, leaflets 7–9 less argenteous than in the type, racemes more elongated 1–2 in. long, pod less decidedly torulose. I. cærulea, *Roxb. Fl. Ind.* iii. 377; *W. & A. Prodr.* 203; *Wt. Ic.* t. 366; *Dalz. & Gibs. Bomb. Fl.* 59. I. retusa, *Grah. in Wall. Cat.* 5476. I. brachycarpa, *Grah. in Wall. Cat.* 5470. I. tinctoria, var. brachycarpa, *DC. Prodr.* ii. 224. Plains of Banda and the Western Peninsula.

28. **I. tinctoria,** *Linn.; DC. Prodr.* ii. 224 (*excl. var.* β); shrubby, faintly argenteo-canescent, leaflets 9–13 large obovate-oblong, pod nearly straight 8–12-seeded not torulose. *Roxb. Fl. Ind.* iii. 379; *Wall. Cat.* 5474; *W. & A. Prodr.* 202; *Wt. Ic.* t. 365; *Dalz. & Gibs. Bomb. Fl.* 59; *Brand. For. Fl.* 135. I. indica, *Lamk. Dict.* iii. 245. I. sumatrana, *Gaertn. Fruct.* ii. 317, t. 148—*Rheede Hort. Mal.* i. t. 54.

The universally cultivated indigo. Whether it be truly wild is doubtful.

A shrub 4–6 ft. high, with twiggy woody thinly silvery branches. *Leaves* 1–2 in. long; leaflets opposite, membranous, turning blackish when dried; petiole ½–1 in. *Racemes* lax, nearly sessile, 2–4 in. long. *Calyx* $\frac{1}{24}$ in., silvery; teeth as long as the tube. *Corolla* $\frac{1}{8}$–$\frac{1}{6}$ in., reddish-yellow. *Pod* ¾–1 in. long, $\frac{1}{12}$ in. thick, glabrescent, scarcely at all recurved.—*I. Anil*, Linn.; DC. Prodr. ii. 225, also commonly cultivated, a native of America, differs by its short congested racemes and pod turned back like a sickle. *I. flaccida* var. *constricta*, Thwaites Enum. 411, from Ceylon, is probably a distinct species, but the flowers are unknown. It has the habit and leaves of *I. tinctoria*, with a slender tetraquetrous subtorulose 4–6-seeded pod.

29. **I. Wightii,** *Grah. in Wall. Cat.* 5458; shrubby, densely argenteo-canescent, leaflets 11–21 small oblanceolate, pod linear straight 8–12-seeded not torulose. *W. & A. Prodr.* 202; *Dalz. & Gibs. Bomb. Fl.* 59. I. foliolosa, *Grah. in Wall. Cat.* 5485. I. polyphylla, *Rottler MSS. non Heyne nec DC.* I. inamœna, *Thwaites Enum.* 83.

Plains of the WESTERN PENINSULA and CEYLON.

A low shrub, with numerous erecto-patent silvery woody branches. *Leaves* short-petioled, 1½–2 in. long; leaflets opposite, rigidly subcoriaceous, persistently silvery, obtuse, ¼–½ in. long. *Racemes* sessile, dense, 1–1½ in. long. *Calyx* $\frac{1}{24}$ in., silvery; teeth linear, as long as the tube. *Corolla* yellowish red, $\frac{1}{8}$–$\frac{1}{6}$ in. long, externally canescent. *Pod* turgid, straight, finely canescent, 1–1½ in. long.

*** *Leaflets many, opposite (except I. Dosua); flowers large for the genus.*

30. **I. cylindracea,** *Wall. Cat.* 5482; shrubby, branches glabrous, leaflets small oblong obscurely hispid, stipellæ and bracts minute, pedicels elongated.

NIPAL, *Wallich.*

An erect shrubby perennial, with slender woody erecto-patent branches. *Leaves* short-petioled, 1½–2 in. long; leaflets membranous, opposite, obtuse, green above, pale below, $\frac{3}{8}$–½ in. long, both sides with a few short adpressed hairs. *Racemes* very lax,

short-peduncled, finally 3–4 in. long; pedicels $\frac{1}{4}$–$\frac{1}{3}$ in. *Calyx* oblique, $\frac{1}{24}$ in.; teeth short. *Corolla* $\frac{1}{2}$ in. long, pale red. *Pod* straight, glabrescent, turgid, 1$\frac{1}{2}$–1$\frac{3}{4}$ in. long, 8–10-seeded.

31. **I. leptostachya,** *DC. Prodr.* ii. 225? shrubby, branches glabrous, leaflets middle-sized oblanceolate-oblong 13–19 obscurely hispid, stipellæ minute, pedicels short, bracts 0.

KHASIA and SIKKIM, temperate zone, 5–8000 ft., *H. f. & T.*

An erect shrub, reaching 10 ft. high, with slender twiggy branches, thinly silky only when young. *Leaves* short-petioled, 3–4 in. long; leaflets membranous, opposite, $\frac{1}{2}$–1 in. long, green above, glaucous below, nearly glabrescent. *Peduncles* reaching 1–2 in.; racemes lax, finally 2–3 in. long; pedicels not much longer than the calyx. *Calyx* $\frac{1}{12}$ in., finely brown-silky; teeth short, deltoid. *Corolla* $\frac{1}{4}$–$\frac{3}{8}$ in., pale red, canescent externally. *Pod* glabrous, straight, 1–1$\frac{1}{2}$ in. long, 6–8-seeded, turgid, with narrow sutures.—The Candollean synonym may not unlikely belong to a form of *I. pulchella.*

32. **I. Gerardiana,** *Wall. Cat.* 5486; shrubby, branchlets argenteo-canescent, leaflets small oblanceolate-oblong 9–17, stipellæ and bracts minute.

TEMPERATE and SUBTROPICAL WESTERN HIMALAYA; common, from the Saltrange to Kumaon, alt. 2–10,000 ft.—DISTRIB. Afghanistan.

A low copiously-branched shrub, the branchlets distinctly argenteo-canescent. *Leaves* short-petioled, 1–2 in. long; leaflets subcoriaceous, $\frac{3}{8}$–$\frac{1}{2}$ in. long, opposite, pale grey-green, thinly clothed with short white bristles above, glaucous and thinly argenteo-canescent below, obtuse, often emarginate. *Racemes* distinctly peduncled, 1–2 in. long, 12–20-flowered; pedicels very short. *Calyx* obliquely campanulate, argenteous, $\frac{1}{12}$ in. long; teeth deltoid-cuspidate. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in., pale red, canescent externally. *Pod* 1$\frac{1}{2}$–2 in. long, subcylindrical, glabrous, 6–10-seeded; sutures narrow.

VAR. *heterantha*; leaflets more numerous 17–25 smaller, corolla and pod smaller, the former, $\frac{1}{4}$ in., the latter 1–1$\frac{1}{2}$ in. long. I. heterantha, *Wall. Cat.* 5480, *A.B.C. ex parte. Brand. For. Fl.* 135. I. Dosua, *Wall. Cat.* 5481 *B.*; *Bot. Reg.* 28, t. 57, *non Hamilt.* I. virgata, *Roxb. Fl. Ind.* iii. 383? I. quadrangularis, *Grah. in Wall. Cat.* 5483. I. polyphylla, *DC. Prodr.* 227?—Temperate and subtropical Himalayas, as far east as Khasia and Bhotan, ascending to 8000 ft.—Distrib. Afghanistan.

33. **I. galegoides,** *DC. Prodr.* ii. 225; shrubby, branches glabrescent, leaflets large oblong 11–25, stipellæ and bracts minute. I. uncinata, *Roxb. Fl. Ind.* iii. 382; *Wall. Cat.* 5472. I. Finlaysoniana, *Wall. Cat.* 5488. I. Zollingeriana, *Miq. Flor. Ind. Bat.* i. 310?

Tropical zone; KHASIA and MERGUI to CEYLON, MALACCA and SIAM.—DISTRIB. Malay isles, Philippines, S. China.

A tall shrub, with twiggy woody branches, thinly coated with adpressed hairs at first. *Leaves* distinctly petioled, $\frac{1}{2}$–1 ft. long; leaflets opposite, membranous, usually obtuse, 1–1$\frac{1}{2}$ or 2 in. long, green above, glaucous below, the hairs short, adpressed, quite obscure. *Racemes* short-peduncled, very dense, 2–3 in. long, not lengthened in fruit. *Calyx* $\frac{1}{24}$ in., canescent; teeth short, deltoid. *Corolla* pale red, $\frac{3}{8}$–$\frac{1}{2}$ in., finely canescent externally. *Pods* glabrous, the longest of the genus, 2$\frac{1}{2}$–3 in. long, subcylindrical, straight, 15–18-seeded, beaked.

34. **I. bracteata,** *Grah. in Wall. Cat.* 5477; suffruticose, branches glabrescent, leaves middle-sized oblanceolate-oblong 7–17, stipellæ and bracts large.

KHASIA, 5–6000 ft., *Hook. fil. & Thomson*; NIPAL, *Wallich*; and an exstipellate form from KASHMIR, 5–6000 ft., *Thomson.*

A low shrub, with copious slender trailing branches with a few adpressed hairs at first. *Leaves* distinctly petioled, 3–4 in., long.; leaflets opposite, membranous, ½–1 in. long, obtuse, pale green above, glaucous beneath, nearly glabrous; stipellæ setaceous, ⅛ in. long. *Peduncles* reaching 2–3 in., bearing a close short raceme, bracts herbaceous, boat-shaped, with a cusp, enfolding the buds. *Calyx* $\frac{1}{12}$ in., campanulate, obscurely hairy; teeth deltoid. *Corolla* ⅜ in. long, pale red. *Pod* linear, glabrous, not seen mature.

35. **I. atropurpurea,** *Hamilt.*; *DC. Prodr.* ii. 225; shrubby, branches glabrescent, leaflets large oblong 11–17, stipellæ minute, bracts lanceolate acuminate exceeding the buds. *Don Prodr.* 244; *Roxb. Fl. Ind.* iii. 381; *Wall. Cat.* 5463; *Wight Ic.* t. 369; *Brand. For. Fl.* 136; *Bot. Mag.* t. 3065; *Bot. Reg.* t. 1744. I. Hamiltonii, *Grah. in Wall. Cat.* 5465.

Tropical and temperate zones, through the HIMALAYAS, from Hazara and the PUNJAB to KHASIA, reaching 9000 ft.

A tall shrub, with twiggy woody branches, only thinly coated with adpressed hairs at first. *Leaves* reaching 6–9 in. long; leaflets opposite, membranous, obtuse, usually 1–1¼ in. long, green above, pale green below, glabrescent; petiole 1–2 in. *Racemes* short-peduncled, long and narrow, 4–8 in. long, dense upwards; bracts ⅛ in., subpersistent, narrowed gradually into a long point; pedicels very short. *Calyx* $\frac{1}{12}$ in., obliquely campanulate; teeth short, deltoid. *Corolla* $\frac{1}{4}$–$\frac{1}{3}$ in., a much darker deeper red than in any of the others. *Pod* linear, turgid, 1–1½ in. long, glabrous, 6–10-seeded, not at all reflexed or narrowed into a beak.

36. **I. hebepetala,** *Benth. MSS.*; shrubby, branches glabrescent, leaflets large oblong 13–17 membranous, stipellæ distinct, bracts boat-shaped cuspidate exceeding the buds.

HIMALAYAS, from KASHMIR to SIKKIM, 6–15,000 ft.

A tall shrub, with twiggy woody branches, only thinly coated with adpressed hairs in the young state. *Leaves* 4–6 in. long; leaflets opposite, membranous, obtuse, usually 1–1½ in. long, much smaller in a subalpine form, dull green above, pale but scarcely glaucous below, with a few short adpressed bristly hairs on both sides. *Racemes* peduncled, 2–4 in. long, laxly 12–20-flowered; pedicels and calyx as in the last; bracts more deciduous, enclosing the buds, with a setaceous tip protruding beyond them. *Corolla* ⅜ in. deep, a much lighter and more crimson red than in *I. atropurpurea*, glabrous externally, the keel ⅛ in. deep. *Pod* glabrous, turgid, straight, 1½–2 in. long, 8–10-seeded.

37. **I. pulchella,** *Roxb. Hort. Beng.* 57; *Fl. Ind.* iii. 382; shrubby, branches obscurely hispid, leaflets large obovate-oblong 13–17 subcoriaceous, stipellæ abortive or very minute, bracts exceeding the buds. *W. & A. Prodr.* 203; *Wight Ic.* t. 367; *Dalz. & Gibs. Bomb. Fl.* 60; *Bedd. Fl. Sylv.* 85; *Anal. Gen.* t. 12, fig. 1. I. purpurascens, *Roxb. Fl. Ind.* iii. 383. I. cassioides, *Rottler*; *DC. Prodr.* ii. 225; *Wall. Cat.* 5468. I. verrucosa, *Grah. in Wall. Cat.* 5469. I. glaucescens, *Grah. in Wall. Cat.* 5484. I. elliptica, *Roxb. Fl. Ind.* iii. 380. I. violacea, *Roxb. Fl. Ind.* iii. 380; *Wall. Cat.* 5479; *Bot. Mag.* t. 3348. I. arborea, *Roxb. Fl. Ind.* iii. 381; *Wall. Cat.* 5478; *Wight Ic.* t. 368. I. Jirahulia, *Hamilt. in Wall. Cat.* 5464. I. Gibsonii, *Grah. Cat. Bomb. Pl.* 46.

Throughout the HIMALAYAS and hills of INDIA PROPER, ascending to 5000 ft. in KUMAON.

A shrub 4–6 feet high, the trunk reaching the thickness of a man's leg. *Branches* sulcate, thinly coated with grey adpressed hairs at first, soon glabrescent. *Leaves* short-petioled, 3–6 in. long; leaflets opposite, firmer in texture than its allies, obtuse, often emarginate, usually ¾–1 in. long, pale green above, glaucous below, thinly

coated with short adpressed grey hairs. *Racemes* short-peduncled, moderately close, 1–3 in. long; pedicels short; bracts exceeding the buds, usually boat-shaped with a cusp. *Calyx* $\frac{1}{12}$ in. long, argenteo-canescent; teeth short deltoid. *Corolla* bright red, glabrous externally, the largest of all the species, generally $\frac{3}{8}$–$\frac{1}{2}$ in., reaching $\frac{3}{4}$–$\frac{7}{8}$ in. long, the standard $\frac{3}{8}$ in. broad, reflexed in the expanded flower. *Pod* straight, turgid, glabrous, 1$\frac{1}{4}$–1$\frac{3}{4}$ in. long, 8–12-seeded, the sutures broader than in the preceding.

38. **I. Dosua,** *Hamilt.*; *DC. Prodr.* ii. 225; shrubby, branches densely pubescent, leaflets small linear-oblong 21–31, stipellæ abortive, bracts exceeding the buds. *Don Prodr.* 244; *Wall. Cat.* 5481 *A, non B, nec Bot. Reg.* 28, t. 57. I. heterantha, *Wall. Cat.* 5480 *C, ex parte.* I. virgata, *Roxb. Fl. Ind.* iii. 383?

TEMPERATE CENTRAL and EAST HIMALAYAS; Simla to Bhotan and ASSAM, 6–8000 ft.

A low shrub, with woody branches, clothed with short spreading grey or brownish pubescence. *Leaves* subsessile, 1–3 in. long; leaflets usually opposite, membranous, obtuse, $\frac{1}{4}$–$\frac{1}{2}$ in. long, dull green above, glaucous below, more or less densely pubescent. *Racemes* distinctly peduncled, moderately close, 1–3 in. long; bracts $\frac{1}{4}$ in. long, lanceolate-cuspidate, silky; pedicels very short. *Calyx* $\frac{1}{12}$ in., densely silky; teeth deltoid-cuspidate. *Corolla* bright red, glabrous, $\frac{3}{8}$–$\frac{1}{2}$ in. *Pod* straight, glabrescent, 1–1$\frac{1}{4}$ in. long, 8–12-seeded, with very broad sutures.

VAR. *tomentosa*; branches clothed with dense brown silky pubescence, leaves 6–9 in. long, leaflets 41–51 often subacute and 1 in. long, racemes longer, bracts densely brown-velvety, with a very long cusp. I. tomentosa, *Grah. in Wall. Cat.* 5487. I. stachyodes, *Lindl. Bot. Reg.* 1843, t. 14.—Khasia, Sikkim, Silhet, Bhotan, 1–5000 ft.

Group 6. *Paniculatæ.* *Leaves* odd-pinnate. *Flowers* in panicled racemes.

39. **I. mysorensis,** *Rottl.*; *DC. Prodr.* ii. 222; *Wall. Cat.* 5459; *W. & A. Prodr.* 202. I. polyphylla, *Heyne MSS., non. DC.*

Plains of the CARNATIC, *Heyne.*

A low erect copiously-branched *shrub*, the young stems slender, clothed with short spreading grey pubescence. *Leaves* sessile, of the main branches 1–3 in. long; leaflets 11–21, oblong, membranous, opposite, $\frac{3}{8}$–$\frac{1}{2}$ in. long, thinly clothed on both sides with adpressed grey hairs; stipules setaceous, $\frac{1}{4}$ in., persistent. *Racemes* lax, elongated, more or less panicled, each flower subtended by a bract just like the leaflets, and the branches furnished low down with 3–5-foliolate leaves. *Calyx* $\frac{1}{8}$ in.; teeth lanceolate, very long. *Corolla* red, glabrous, twice the calyx. *Pod* linear-cylindrical, straight, $\frac{1}{4}$–$\frac{3}{8}$ in. long, 4–6-seeded, finely pubescent.

SUBGEN. 4. **Amecarpus,** Benth. *Ovary* with at least two ovules. *Pod* linear, unarmed, flattened.

40. **I. anabaptista,** *Steud. Nom. edit.* 2, 805. I. Hochstetteri, *Baker in Oliv. Flor. Trop. Africa,* ii. 101. I. ornithopodioides, *Hochst. et Steud. in Schimp. Hb. Arab.* No. 769; *Jaub. et Spach Ill. Pl. Orient.* t. 480; *Boiss. Fl. Orient.* ii. 188, *non Schum. et Thonn.*

Plains of SCINDE and the PUNJAB.—DISTRIB. Afghanistan, Arabia, Nile-country.

A diffuse annual, with stems 1 ft. or more long, thinly clothed with adpressed white hairs. *Leaves* short-petioled; leaflets 3–7, opposite, oblanceolate $\frac{1}{2}$–1 in. long. *Racemes* short-peduncled, closely 12–20-flowered, under an inch long. *Calyx* $\frac{1}{8}$ in., argenteo-canescent; teeth setaceous. *Corolla* scarcely exserted. *Pod* linear, reflexed, $\frac{1}{2}$–$\frac{3}{4}$ in. long, 6–8-seeded.

18. PSORALEA, Linn.

Herbs or undershrubs. *Leaves* simple or odd-pinnate, conspicuously gland-dotted. *Calyx*-tube campanulate; teeth 5, distinct. *Corolla* little exserted; petals all with distinct claws; keel obtuse, the tip slightly incurved. Upper *stamen* free or connate, the tube in an early stage often closed; anthers small, uniform or slightly dimorphous. *Ovary* sessile or short-stalked, ovulate; style long, filiform, incurved, stigma minute, terminal. *Pod* ovoid or oblong, 1-seeded, indehiscent, the pericarp adhering to the seed.—DISTRIB. Species about 100, mainly Cape and N. American.

1. **P. corylifolia,** *Linn.*; *DC. Prodr.* ii. 218; herbaceous, leaves simple, racemes dense short. *Burm. Fl. Ind.* 172, t. 49, fig. 2; *Roxb. Fl. Ind.* iii. 387; *Wall. Cat.* 5351; *W. & A. Prodr.* 198; *Bot. Mag.* t. 665; *Dalz. & Gibs. Bomb. Fl.* 60. Trifolium unifolium, *Forsk. Flor. Ægypt. Arab.* 130; *Burm. Fl. Ind.* t. 49.

Plains from the HIMALAYAS through India proper to CEYLON.

An erect annual, 1–3 ft. high. *Branches* firm, conspicuously gland-dotted. *Leaves* distinctly petioled, roundish, 1–3 in. long, inciso-repand, firm in texture, both sides conspicuously dotted with black dots, nearly glabrescent. *Flowers* 10–30 in dense copious long-peduncled heads. *Calyx* nearly sessile, $\frac{1}{8}$ in.; teeth lanceolate, long, the lowest longest. *Corolla* yellow, little exserted. *Pod* small, black, subglobose, glabrous.

2. **P. plicata,** *Delile*; *DC. Prodr.* ii. 221; shrubby, leaves trifoliolate, racemes lax elongated. *Delile, Egypt*, t. 37, fig. 3.

Plains of the PUNJAB, *Thomson, Edgeworth, Stewart.*—DISTRIB. Arabia, Egypt, Trop. Africa.

A low copiously-branched shrub, the stems obscurely argenteo-canescent, verrucose, the denuded branchlets subspinescent. *Leaves* short-petioled; leaflets subcoriaceous, dull green, oblanceolate, obtuse, repand, gland-dotted below only, reaching $\frac{1}{2}$–1 in. long, the end one largest, the side ones oblique. *Racemes* short-peduncled, 2–3 in. long; lower flowers in distant fascicles; bracts ovate, very minute. *Calyx* $\frac{1}{8}$ in., clothed with adpressed white hairs, accrescent, clasping tightly the included pod; teeth short, the lowest longest. *Corolla* yellow, slightly exserted.

19. COLUTEA, Linn.

Shrubs with odd-pinnate leaves and showy yellow flowers in sparse copious axillary racemes. *Calyx* campanulate, with 5 short teeth. *Corolla* much exserted; standard round, fixed in its place by two basal callosities; keel broad, much incurved, not beaked. *Stamens* diadelphous; anthers uniform. *Ovary* stipitate, linear, ∞-ovulate; style filiform, much incurved, bearded along the inner side, stigma large oblique. *Pod* large, membranous, inflated, continuous within, nearly or quite indehiscent.—DISTRIB. Species 3 or 4, spread through South Europe and Temperate Asia.

6 1498

1. **C. arborescens,** *Linn.* var. NEPALENSIS. C. nepalensis, *Sims Bot. Mag.* t. 2622; *Lindl. Bot. Reg.* t. 1727; *Benth. in Royle Ill.* 198; *Brand. For. Fl.* 136.

TEMPERATE WEST HIMALAYA, KUNAWAR, TIBET, NIPAL, &c., alt. 8–11,000 ft.—DISTRIB. Orient, S. Europe.

A subglabrous shrub, 6–10 ft. high. *Leaflets* 9–13, obovate, pale green, $\frac{1}{4}$–$\frac{3}{8}$ in. long, often emarginate, obscurely silky in the young state. *Racemes* as long as the leaves, laxly 3–4-flowered. *Calyx* $\frac{1}{6}$–$\frac{1}{4}$ in. *Corolla* bright yellow, $\frac{3}{4}$ in. long; standard furnished at the base with two nipple-shaped papillæ. *Pod* $\frac{1}{2}$–2 in. long, faintly downy when young, splitting at the tip before ripening.

20. MILLETTIA, Wt. & Arn.

Trees or large shrubs, usually climbers. *Leaves* odd-pinnate. *Flowers* showy, in axillary racemes, often fascicled, simple or paniculate and terminal. *Calyx* campanulate; teeth generally short or nearly obsolete. *Corolla* much exserted; petals with long claws; standard broad; keel not beaked. *Stamens* monadelphous or diadelphous, filaments filiform; anthers uniform. *Ovary* sessile, linear, few-ovuled; style filiform, incurved, glabrous, stigma capitate. *Pod* linear or oblong, 1- or few-seeded, flat or turgid, late in dehiscing or hardly dehiscent.—DISTRIB. Species 40–50, spread through the tropics of the Old World.

SUBGEN. 1. **Eumillettia.** *Standard* not auricled at the base. *Stamens* monadelphous or diadelphous.

* *Leaves lustrous beneath, with thin silky pubescence.*

1. **M. sericea,** *W. & A. Prodr.* 263; leaflets 7–9 coriaceous obovate-oblong cuspidate exstipellate sericeous below, standard densely silky on the back, stamens monadelphous, pod linear velvety. *Benth. Pl. Jung.* 248. Pongamia sericea, *Vent.*; *DC. Prodr.* ii. 416. Dalbergia angustifolia, *Hassk. Pl. Jav. Rar.* 399.

Forests of BIRMA, MALACCA, PENANG, and SINGAPORE. — DISTRIB. Malay Islands.

A woody climber, the branchlets covered with fine short brown pubescence. *Leaves* 1 ft. or more long; leaflets 6–9 in. long, shining and glabrous above, on petiolules $\frac{1}{4}$–$\frac{3}{8}$ in. long; pubescence beneath grey or pale brown. *Racemes* lateral, 6–9 in. long, the lower nodes with very short branches, bearing dense fascicles of pedicellate flowers. *Calyx* $\frac{1}{8}$ in., silky, scarcely toothed. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in., reddish, very silky. *Pod* 4–5 in. long, densely coated with thick dark brown velvet.

2. **M. rubiginosa,** *W. & A. Prodr.* 263; leaflets 5–7 coriaceous obovate-oblong cuspidate stipellate sericeous beneath, standard densely silky on the back, stamens diadelphous, pod oblong glabrescent. *Wight Ic.* t. 207.

Hills in the CARNATIC near Courtallum, *Wight.*

Habit of the preceding, the branchlets and underside of the leaves coated with persistent shining yellowish-brown silky down. *Leaflets* 4–8 in. long, not shining, when young sericeous also above; stipellæ obscure; petiolules $\frac{1}{2}$–$\frac{5}{8}$ in. long. *Racemes* nearly as long as the leaves, most of the nodes bearing short branchlets, on the tip of which the flowers are fascicled. *Calyx* campanulate, silky, $\frac{1}{8}$ in., short-pedicelled. *Corolla* reddish, $\frac{1}{2}$ in., densely silky. *Pod* 2–3 in. long, sublignose, 2–3-seeded, when young densely velvety.

3. **M. splendens,** *W. & A. Prodr.* 263; leaflets 7–9 coriaceous oblanceolate-oblong cuspidate stipellate sericeous below, standard densely silky on the back, stamens diadelphous.

Tropical forests of the NILGHIRIS and ANAMALLAY hills.

Habit and inflorescence of the two preceding, the branchlets and leaves beneath coated persistently with white or yellowish-brown shining short silky hairs. *Leaflets* 6–9 in. long, opaque, glabrous above; stipellæ setaceous; petiolules $\frac{1}{6}$–$\frac{1}{4}$ in. *Racemes* shorter than the leaves, the nearly sessile flowers densely fascicled at the end of short branchlets. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in., densely silky, with a pair of small ovate bracteoles. *Corolla* reddish, $\frac{1}{4}$ in. long. *Ovary* linear, densely silky, 4–5 ovulate. *Pod* not seen.

** *Leaves opaque, pubescent beneath.*

4. **M. pulchra,** *Benth. MSS.*; leaflets small 15–19 scarcely subcoria-

ceous oblanceolate-oblong acute stipellate slightly silky below, standard glabrous on the back, stamens monadelphous, pod glabrous linear rigidly coriaceous flat smooth. Mundulea pulchra, *Benth. Pl. Jung.* 248. Tephrosia pulchra, *Coleb. in Wall. Cat.* 5630. Pongamia cassioides, *Wall. Cat.* 5918. Dalbergia tephrosioides, *W. & A. Prodr.* 210.

Forests of KHASIA, ASSAM, SILHET, AVA, and BIRMA, ascending to 4000 ft.—DISTRIB. Philippines, *Cuming,* 1208 ?

An erect tree, with the branches and leaves below thinly clothed with opaque greyish silkish pubescence. *Leaves* and leaflets the smallest of all the species, the former not more than 2–5 in. long, green and pubescent above; petiolules very short and stipellæ minute. *Racemes* copious, shorter than the leaves, the flowers fascicled, shortly peduncled from the main rachis. *Calyx* $\frac{1}{8}$ in., scarcely toothed. *Corolla* reddish, $\frac{3}{8}$–$\frac{1}{2}$ in. *Pod* 2–4 in long, $\frac{1}{2}$ in. broad, 1–4-seeded.

5. **M. racemosa,** *Benth. Pl. Jung.* 249; leaflets 13–15 scarcely subcoriaceous obovate-oblong acute distinctly stipellate slightly downy beneath, standard glabrous on the back, stamens diadelphous, pod coriaceous glabrous torulose. Tephrosia racemosa, *W. & A. Prodr.* 210 ? Robinia racemosa, *Roxb. Fl. Ind.* iii. 329 ? Pongamia racemosa, *Grah. in Wall. Cat.* 5914. Wisteria pallida, *Dalz. & Gibs. Bomb. Flora,* 61. W. racemosa, *Dalz. & Gibs. loc. cit.* Pongamia Corcor, *Grah. in Wall. Cat.* 5891 ? Millettia pallida, *Dalz. in Linn. Journ.* xiii. 187.

Tropical forests of the CONCAN and ORISSA.

A woody climber, with thinly silky branches. *Leaves* reaching 1 ft. long; leaflets 2–3 in. long, scarcely more than membranous, glabrous above, obscurely silky or glabrescent below; petiolules short, with large setaceous stipellæ. *Racemes* copiously panicled, the flowers not fascicled on short branchlets, but close shortly pedicellate on the main rachis; bracts exceeding the buds, setaceous, deciduous. *Calyx* $\frac{1}{8}$ in., densely silky. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in., whitish. *Pod* linear, narrow, $\frac{1}{2}$ ft. long, 4–5-seeded.

Roxburgh's plant, which inhabits the forests of Orissa, may be distinct. As figured in his set of unpublished plates it has red flowers and much smaller bracts.

6. **M. pendula,** *Benth. Pl. Jung.* 250; leaflets 7 obovate-oblong cuspidate membranous exstipellate closely silky beneath, standard glabrous, pod flat woody glabrous. Pongamia pendula, *Grah. in Wall. Cat.* 5902. Millettia leucantha, *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 68.

AVA, Prome hills, *Wallich*; BIRMA, forests of Pegu, *McLelland, Kurz.*

An erect tree, with thinly silky branchlets, and leaves $\frac{1}{2}$ ft. long. *Leaflets* thin, flexible, 2–3 in. long, dull green, thinly silky above, when mature densely clothed with adpressed grey silky pubescence below, the lowest as long as broad; petiolules under $\frac{1}{4}$ in. *Flowers* in short dense racemes in the axils of the leaves; pedicels densely fascicled, $\frac{1}{8}$–$\frac{1}{6}$ in. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., shortly grey-silky; teeth deltoid, shorter than the tube. *Corolla* shorter than the calyx. *Pod* oblong, 3–5 in. long, $1\frac{1}{4}$ in. broad, tubercled, 1–3-seeded.

7. **M. cana,** *Benth. Pl. Jung.* 250; leaflets 7 obovate-oblong rather obtuse coriaceous exstipellate thinly matted with adpressed grey hairs beneath, standard glabrous, pod flat rigidly coriaceous obscurely grey-canescent. Pongamia cana, *Grah. in Wall. Cat.* 5903.

AVA; banks of the Irrawaddi at Yenanghuen, *Wallich.*

Climber, with grey pubescent branches and leaf-rachis, the latter $\frac{1}{2}$ ft. long. Side *leaflets* oblong, $2\frac{1}{2}$–3 in. long, the end one obovate; upper surface glabrous, rather shining; petiolules $\frac{1}{8}$ in. *Buds* densely crowded; pedicels very short; bracts lanceolate, silky, as long as the calyx. *Calyx* minute, densely brown-sericeous; teeth deltoid, half as long as the tube. *Pod* dehiscing early for the genus, 2–3 by $\frac{3}{4}$–$\frac{7}{8}$ in.

8. **M. tetraptera,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 69; leaflets 7 subcoriaceous obovate-oblong exstipellate at first densely softly pubescent on both sides, standard glabrous, stamens monadelphous, pod glabrous indehiscent with each suture produced into a broad hard horizontal wing on both sides. Pongamia tetraptera, *Hort. Calc.* Legum. indeterm., *Wall. Cat.* 5976.

BIRMA; forests of Pegu, &c. *Wallich, Griffith, Kurz.*

An erect tree, with branchlets clothed with dense drab-brown short pubescence. *Leaflets* obtuse, 3–4 in. long, flexible and densely soft-pubescent at first, but becoming rigid and glabrescent when mature; petiolules under $\frac{1}{4}$ in. *Flowers* in short close nearly sessile racemes in the axils of the leaves; pedicles fascicled, $\frac{1}{12}$–$\frac{1}{6}$ in. *Calyx* $\frac{1}{8}$ in., thinly clothed with adpressed hairs; teeth deltoid. *Corolla* pale blue. *Pod* sublignose, quadrangular, straight, linear 3–4 in. long, nearly an inch thick, the wings $\frac{1}{4}$–$\frac{3}{8}$ in. broad in the middle, narrowed to each end.

9. **M. pubinervis,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 68; leaflets elliptic-obovate obtusely acuminate glaucous and pubescent on the midrib below, standard glabrous on the back, ovary pubescent, pod unknown.

MARTABAN, *Kurz.*

An erect tree 20–25 ft. high, the young parts puberulous. *Leaf* $\frac{1}{2}$ ft. with a puberulous rachis; leaflets (number not stated) 2–3 in. long, thinly chartaceous. *Racemes* leaf-opposed, slender, simple, 2$\frac{1}{2}$–3 in. long; pedicels capillary, pubescent, solitary or fascicled. *Calyx* reddish, broader than deep, $\frac{1}{12}$–$\frac{1}{8}$ in. long, slightly pubescent, obscurely toothed. *Corolla* yellowish-white; standard above $\frac{1}{3}$ in. long.—*Kurz loc. cit.*

10. **M. monticola,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 67; leaflets 7–9 oblong shortly acuminate fulvo-pubescent beneath, standard glabrous, ovary thinly ferrugineo-pubescent, pod unknown.

MARTABAN, alt. 7000 ft., *Kurz.*

A robust climber, resembling *M. pachycarpa,* with verrucose branches and ferrugineo-pubescent glabrescent branchlets. *Leaflets* petioluled, with adpressed fulvous pubescence on the ribs. *Flowers* blue, in simple solitary racemes 4–7 in. long, arising above the scars of the fallen leaves. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., longer than broad; teeth obscure, anterior one largest. *Standard* $\frac{1}{2}$ in., petals much smaller than those of *M. pachycarpa.* —*Kurz loc. cit.*

11. **M. pachycarpa,** *Benth. Pl. Jung.* 250; leaflets 11–13 subcoriaceous oblanceolate-oblong cuspidate exstipellate finely downy below, standard glabrous on the back, stamens monadelphous, pod woody rugose glabrous.

Forests of KHASIA, SIKKIM, and ASSAM up to 4000 ft. MALACCA, *Griffith.*

A large climber, with the branches and leaves below more or less densely clothed with pale brown pubescence. *Leaves* 1 ft. or more long; leaflets 6–8 in. long, glabrous, opaque above, sometimes subcaudate, the pubescence below short, loose, deciduous; petiolules $\frac{1}{6}$–$\frac{1}{4}$ in. *Racemes* copious, 6–9 in. long, most of the nodes with short branchlets. *Calyx* $\frac{1}{6}$–$\frac{1}{4}$ in., distinctly pedicelled, densely downy; teeth very short. *Corolla* $\frac{3}{4}$–1 in. long. *Pod* 1–3-seeded, rugose, 1–1$\frac{1}{4}$ in. broad, reaching 4–5 in. long.

*** *Mature leaflets glabrescent beneath.*

12. **M. cinerea,** *Benth. Pl. Jung.* 249; leaflets 5–7 obovate-oblong cuspidate membranous stipellate soon glabrescent beneath, standard densely silky on the back, stamens diadelphous, pod thick linear velvety torulose. Pongamia cinerea, *Grah. in Wall. Cat.* 5888. P. palustris, *Grah. in Wall. Cat.* 5889; P. paniculata, *Grah. in Wall. Cat.* 5904. P. heterocarpa, *Wall. MSS.* P. oblonga, *Grah. in Wall. Cat.* 5893?

Forests of SIKKIM, KHASIA, SILHET, ASSAM, CHITTAGONG, and BIRMA, ascending to 4000 ft.—DISTRIB. China ?

A woody climber, with young branchlets and leaves below with a little opaque grey deciduous pubescence. *Leaflets* large, reaching $\frac{1}{2}$–1 ft. long, thin and flexible; both sides green; petiolules and setaceous stipellæ $\frac{1}{8}$–$\frac{1}{6}$ in. *Racemes* most or all in a panicle above the leaves; flowers distinctly pedicellate, not fascicled, subtended by a pair of setaceous bracteoles. *Calyx* $\frac{1}{6}$ in., densely silky, distinctly toothed. *Corolla* $\frac{1}{2}$–$\frac{2}{3}$ in., densely coated with grey silk. *Pod* very turgid, 4–5 in. long, 1 in. broad, 3-5-seeded, sublignose.

13. **M. ovalifolia,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 68, *excl. syn. W. & A.*; leaflets 7 ovate-elliptic shortly acuminate chartaceous glabrous, standard glabrous on the back, pod small linear-oblong glabrous flattish with obtuse sutures.

BIRMA, at Prome, *Kurz.*

An erect glabrous middle-sized tree. *Leaves* $\frac{1}{3}$–$1\frac{1}{2}$ ft.; leaflets $\frac{1}{2}$–1 in. long, glaucescent and finely reticulated beneath; petiolules slender, $\frac{1}{12}$ to $\frac{1}{8}$ in. *Racemes* slender, glabrous, 2–3 inches, one or several together, arising from young branchlets; pedicels capillary, solitary or fascicled. *Calyx* glabrous, purplish, broader than long, $\frac{1}{12}$ in., long, nearly truncate. *Corolla* blue; standard $\frac{1}{4}$ in. long. *Pod* 2–3 in. long, 2–3-seeded at middle, sublignose, pale, incurved, narrowed to base, sparsely verrucose.—*Kurz loc. cit.*

14. **M. cærulea,** *Baker*; leaflets 7 obovate-oblong cuspidate subcoriaceous stipellate glabrous, standard densely silky, stamens monadelphous, pod large flat rather woody finely brown-velvety. Pongamia cærulea, *Grah. in Wall. Cat.* 5894.

AVA, at Phanoe, *Wallich*; MALACCA, *Maingay.*

A woody climber, with glabrous branches. *Leaflets* 4–6 in. long, glabrous on both sides from an early stage; petiolules $\frac{1}{8}$–$\frac{1}{6}$ in. *Flowers* in close short-peduncled racemes in the axils of the leaves; pedicels very short, densely fascicled. *Calyx* campanulate, $\frac{1}{12}$ long, faintly silky, nearly truncate. *Corolla* three times the calyx, the standard densely white-canescent on the back. *Pod* linear-oblong, 7-8 in. long, $1\frac{1}{2}$–$1\frac{3}{4}$ in. broad, recurved, late in dehiscing, clothed with dense short persistent brown velvety pubescence.

15. **M. glaucescens,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 67; leaflets obovate-oblong cuspidate membranous exstipellate glabrous beneath, standard glabrous on the back, stamens monadelphous, pod flat on the face woody linear-oblong glabrous not torulose with both sutures expanded into narrow wings.

BIRMA; forests of Pegu and Martaban, *Kurz.*

A woody climber, with glabrous branchlets. *Leaflets* thin, flexible, green above, dull below, reaching $\frac{1}{2}$ ft.; petiolules $\frac{1}{4}$ in. *Racemes* close, simple, $\frac{1}{2}$ ft. long, axillary on short peduncles; pedicels in pairs, exceeding the calyx. *Calyx* $\frac{1}{8}$ in., with a few minute hairs; teeth deltoid. *Corolla* $\frac{3}{8}$ in., steel-blue. *Pod* 3–4-seeded, tubercled, $\frac{1}{2}$ ft. by 1 in.

16. **M. Piscidia,** *Wight Ic.* t. 86; leaflets 5–7 obovate-oblong cuspidate rigidly coriaceous exstipellate glabrous, standard glabrous on the back, stamens diadelphous, pod thin compressed oblong glabrous. Galedupa Piscidia, *Roxb. Fl. Ind.* iii. 241.

Forests of SIKKIM, KHASIA, SILHET, and MISHMI, ascending to 4000 ft.

A woody climber, with whitish branchlets, only the youngest branchlets and leaves

finely silky. *Leaflets* of medium size, reaching 3–4 in. long, both sides green, quite glabrous; petiolules short. *Racemes* copious, short, simple, laxly flowered; pedicels $\frac{1}{4}$–$\frac{3}{8}$ in., often geminate, neither bracteate nor bracteolate. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in., thinly silky; teeth short, obtuse. *Corolla* snow-white, $\frac{1}{2}$–$\frac{5}{8}$ in. *Pod* 3–4 in. by 1–1$\frac{1}{4}$ in., narrowed to a point; valves quite smooth, dehiscing earlier than in the other species.

17. **M. Brandisiana,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 69; leaflets 13 or more lanceolate glabrous subcoriaceous stipellate, standard silky on the back, stamens diadelphous, pod thin compressed ligulate-oblong glabrous.

BIRMA, near Yomah, *Kurz.*

An erect tree, with slender terete glabrous branches. *Leaflets* 1–1$\frac{1}{2}$ in. long, narrowed to an obtuse tip, rather rounded at the base. *Racemes* very lax, panicled at the end of the branches and sending out small shoots from the lower nodes; pedicels much shorter than the calyx; bracts minute, glabrous, lanceolate. *Calyx* $\frac{1}{4}$ in. glabrous, broadly campanulate; teeth deltoid. *Corolla* lilac, $\frac{5}{8}$–$\frac{3}{4}$ in. *Pod* 3–4 in. long, under an inch broad, 2–4-seeded, the valves quite smooth and flat, twisting when dried.

18. **M. eriantha,** *Benth. Pl. Jung.* 250; leaflets 5 obovate-oblong cuspidate rigidly coriaceous exstipellate glabrous, standard densely silky, stamens diadelphous, pod oblong lignose rugose glabrescent.

Forests of MALACCA, *Griffith, Maingay.*

A woody climber, with only the youngest branches silky. *Leaflets* reaching 5–6 in. long, very rigid in texture, both sides green and quite glabrous; petiolules $\frac{1}{4}$–$\frac{3}{8}$ in. *Racemes* copious, short, subsessile, dense, subspicate; bracts large, roundish, densely silky, clasping and hiding the buds. *Calyx* subsessile, $\frac{3}{8}$ in., clothed with bright yellowish-brown silky pubescence, like the bracts and standard; teeth as long as the tube, broad, imbricated. *Corolla* $\frac{3}{4}$–1 in., densely silky. *Pod* beaked, turgid, 3 in. long, 1-seeded, subindehiscent.

19. **M. atropurpurea,** *Benth. Pl. Jung.* 249; leaflets 7–9 oblong acute rigidly coriaceous exstipellate glabrous, standard glabrous, stamens diadelphous, pod oblong convex smooth rather woody glabrous. Pongamia atropurpurea, *Wall. Cat.* 5910; *Pl. As. Rar.* t. 78.

Forests of MARTABAN, TENASSERIM, MALACCA, and PENANG.—DISTRIB. Sumatra.

An erect tree, with thick, glabrous branches. *Leaflets* 4–6 in. long, very thick and rigid, shining above, both sides quite glabrous, reticulato-venose; petiolules $\frac{1}{4}$–$\frac{1}{8}$ in. *Inflorescence* a dense terminal panicle above the leaves; racemes not branched; bracts minute, ovate; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in. *Calyx* $\frac{1}{4}$ in., thinly silky; teeth short obscure. *Corolla* dark purple, 1 in. long. *Pod* narrowed to both ends, 3 in. long, subindehiscent, 1-seeded in our specimens.

SUBGEN. 2. **Otosema,** Benth. *Standard* auricled at the base on both sides of the claw. *Stamens* monadelphous.

20. **M. auriculata,** *Baker*; branchlets finely downy, leaflets 7–9 obovate obtuse or cuspidate membranous thinly silky, flowers shortly pedicellate, pod woody permanently sericeous. *Brand. For. Flor.* 138. Robinia macrophylla, *Roxb. Fl. Ind.* iii. 329. Pongamia macrophylla, *Grah. in Wall. Cat.* 5892. Otosema macrophylla, *Benth. Pl. Jung.* 249. Amerimnum pallidum, *Hamilt. MSS.*

ROHILCUND and KUMAON to SIKKIM, reaching 3500 ft.; also on Parasnath in BEHAR.

A large, robust, woody climber. *Leaves* reaching 1–2 ft. long; petiole 4–6 in. long; leaflets green, glabrescent above, 6–12 in. by 3–6 in., minutely stipellate, pale below, sometimes subcoriaceous. *Flowers* in copious close axillary racemes near the top of the branches, fascicled on a downy rachis 4–6 in. long; bracts minute, linear. *Calyx* ⅙ in., densely silky; teeth very short. *Corolla* whitish, three times the calyx, densely silky. *Pod* straight, very hard, 5–6 in. long, 1 in. broad; sutures thickened.

21. **M. fruticosa,** *Benth. MSS.*; branches finely downy, leaflets 9–11 oblanceolate-oblong obtuse or subacute thinly silky, flowers subsessile, pod woody glabrescent. Robinia fruticosa, *Roxb. Fl. Ind.* iii. 328. Pongamia fruticosa, *Grah. in Wall. Cat.* 909. Otosema fruticosa, *Benth. Pl. Jung.* 249. Amerimnum fasciculatum, *Hamilt. MSS.*

Forests of BENGAL, ASSAM and PEGU.

A woody climber. *Leaves* long-petioled, ½–1 ft. long; leaflets 4–6 in. long, 1½–2 in. broad, obscurely stipellate, glabrous above, thinly sericeous beneath. *Flowers* in dense short axillary racemes and also in terminal panicles. *Calyx* ⅙ in., densely sericeous, subtended by minute ovate bracts and bracteoles. *Corolla* ⅜ in. red, the standard densely silky. *Pod* hard and woody, silky when young, 6–7 in. by 1–1¼ in.

22. **M. extensa,** *Benth. MSS.*; branches finely downy, leaflets 9–11 obovate-oblong membranous acute thinly silky, flowers short-pedicelled. Pongamia? extensa, *Wall. Cat.* 5900. Otosema extensa, *Benth. Pl. Jung.* 249.

MARTABAN, *Wallich.*

A little-known climbing species, closely allied to the two preceding. *Leaflets* long-petioled, distantly placed on an elongated nearly glabrous rachis, glabrescent above, not seen fully developed. *Flowers* in very copious close axillary racemes 6–8 in. long near the top of the branches. *Calyx* ⅛ in., campanulate, scarcely toothed, with a pair of very minute bracteoles at the base. *Corolla* ⅜ in., densely silky, reddish lilac. *Pod* like that of *M. auriculata* when young, but not seen mature.

23. **M. leiogyna,** *Kurz in Journ. As. Soc. Beng.* xlii. 2, 67; branches ferrugineo-tomentose, leaflets 9–13, flowers distinctly pedicelled, ovary glabrous.

MARTABAN, *Kurz.*

A woody climber with terete minutely lenticellate branches, all the young parts ferrugineo-tomentose. Adult *leaves* not known. *Racemes* 4–5 in., arising from shortened lateral branches, and forming usually ample lateral panicles; pedicels ⅙–¼ in., nodding, velvety. *Calyx* broader than deep, under ¼ in. long, fulvous-velvety, obscurely toothed, upper tooth largest. *Corolla* glabrous, violet; standard ½ in. long, emarginate, yellow at the throat. Young *pod* smooth, linear, acuminate. Placed by Kurz next to *M. extensa*. I have seen no specimen.

24. **M. caudata,** *Baker*; branches glabrous, leaflets 7–9 oblong caudate coriaceous glabrous, flowers pedicellate, pod glabrescent not woody. Pongamia? caudata, *Grah. Wall. Cat.* 5895. Otosema caudata, *Benth. Pl. Jung.* 249.

Forests of KHASIA and SILHET, ascending to 3000 ft.

A woody climber. *Leaflets* minutely stipellate, 6–9 in. long, firm, bright green above, glaucous below, narrowed out at the tip into a long distinct tail. *Racemes* axillary, short-peduncled, not so dense as in the others, 4–6 in. long. *Calyx* campanulate, ⅛ in., scarcely toothed, densely silky. *Bracts* very minute. *Corolla* ¼–⅜ in., densely silky. *Pod* linear, straight, rigidly-coriaceous, subequally turgid, 3–4 in. long, ½ in. broad.

DOUBTFUL SPECIES.

The following are probable species of *Millettia*, of which either flowers or pods are unknown.

Leaflets and pod as in *M. atropurpurea*, but the latter 6–7 in. long, 2–2½ in. broad, smooth, woody, flat, perhaps indehiscent.—MALACCA, *Griffith*, 1835.

Leaflets 7, subcoriaceous, obovate, very obtuse, opaque, 3–4 in. long, obscurely grey-canescent below. *Pod* linear, 4–5 in. long, flat, ¾ in. broad, several-seeded, with similar vestiture. PEGU, *McClelland*. May be PADBRUGGIA DASYPHYLLA, *Miq. Flor. Ind. Bat.* i. 150.

M. MAINGAYI, *Baker*. *Leaflets* 15 or more, oblong, coriaceous, 1½–2 in. long, rounded at both ends, pubescent below. *Pod* oblong, woody, indehiscent, rounded at both ends, 4 in. long, 2½ in. broad, an inch thick, turgid, densely clothed with short brown velvety pubescence, the surfaces traversed by deep longitudinal grooves. SINGAPORE, *Maingay*.

PONGAMIA ANGUSTIFOLIA, *Ham. in Wall. Cat.* 5917. *Leaflets* 9, exstipellate, not coriaceous, glabrous, oblanceolate-oblong, acuminate, 2–3 in. long. *Inflorescence* and separate flowers just as in *M. glaucescens*. NIPAL, *Hamilton*.

21. **MUNDULEA,** DC.

Shrubs. *Leaves* odd-pinnate. *Flowers* in dense terminal racemes. *Calyx* campanulate; teeth short, deltoid. *Corolla* much exserted; standard obovate, with a long claw; wings oblanceolate, adhering to the incurved keel, which has a short obtuse point. *Stamens* monadelphous; alternate filaments slightly dilated; anthers uniform. *Ovary* sessile, linear, many-ovuled; style filiform, glabrous, much incurved; stigma capitate. *Pod* large, linear, subindehiscent. DISTRIB. Species 3, the two others plants of Madagascar.

1. **M. suberosa,** *Benth. Pl. Jung.* 248; *Bedd. Fl. Sylv.* 85; *Anal. Gen.* t. 12, fig. 2. Tephrosia suberosa, *DC. Prodr.* ii. 249; *Hook. Ic. Pl.* t. 120; *Wall. Cat.* 5628; *W. & A. Prodr.* 210; *Wt. Ill.* t. 79 ("82"); *Dalz. & Gibs. Bomb. Fl.* 60. Robinia suberosa, *Roxb. Fl. Ind.* iii. 327. R. sennoides, *Roxb. Fl. Ind.* iii. 328. Tephrosia sericea, *DC. Prodr.* ii. 249; *Wall. Cat.* 5629. Cytisus sericeus, *Willd. Sp.* iii. 1121. T. Petersiana, *Klotzsch in Peters Mossamb. Bot.* t. 9. T. icthynica, *Bert. Misc.* xviii. 18, t. 3.

Hill-valleys of the WESTERN PENINSULA and CEYLON.—DISTRIB. Trop. Africa, Natal.

A stout erect shrub, with thick corky bark. *Branches*, rachises, pedicels and leaves beneath densely sericeous. *Leaflets* 6–10-jugate, oblong-lanceolate, coriaceous, 1½–2 in. long. *Flowers* in close terminal racemes. *Pedicels* 2–3 times the campanulate calyx. *Corolla* ¾–1 in. long, reddish, thinly silvery. *Pod* 3–4 in. long, densely sericeous, 6–8-seeded, both sutures thickened so as to form prominent borders.

22. **TEPHROSIA,** Pers.

Herbs or undershrubs. *Leaves* usually odd-pinnate; leaflets opposite, subcoriaceous. *Flowers* in leaf-opposed racemes or solitary or in pairs in the axils of the leaves. *Calyx*-tube campanulate; teeth distinct, subequal. *Petals* clawed; standard suborbicular; keel incurved, not beaked. *Stamens* diadelphous; anthers obtuse, uniform. *Ovary* sessile, linear, many-ovuled; style much incurved, filiform or flattened, glabrous or bearded; stigma capitate often penicillate. *Pod* linear, flattened, many-seeded, 2-valved, continuous or obscurely septate between the seeds. DISTRIB. Species about 100, spread through the Tropics of both hemispheres.

SUBGEN. 1. **Macronyx** (*Dalzell*). Annual. *Leaves* simple.

1. **T. tenuis,** *Wall. Cat.* 5970; *Dalz. & Gibs. Bomb. Fl.* 61. Macronyx strigosus, *Dalz. in Hook. Kew Journ.* ii. 35.

Plains of SCINDE, the PUNJAB and CONCAN.

Stems filiform, densely cæspitose, $\frac{1}{2}$–1 ft. long with a few short adpressed hairs. *Leaves* nearly sessile, linear, 1–2 in. long, narrowed suddenly or gradually at the point, glabrous above, obscurely silky beneath; stipules minute, setaceous, ascending. *Flowers* 1–2 together in the axils of the leaves. *Pedicels* filiform, $\frac{1}{8}$–$\frac{3}{8}$ in. *Calyx* $\frac{1}{12}$ in.; teeth lanceolate, much shorter than the tube. *Corolla* $\frac{1}{8}$ in., all the petals with very long claws. *Pod* linear, $\frac{1}{2}$–1 in. long, 6–10-seeded, thinly clothed with adpressed hairs. *Style* short, glabrous, filiform.

SUBGEN. 2. **Brissonia** (*Neck.*). Shrubby. *Leaves* odd-pinnate. *Calyx-teeth* short, deltoid.

2. **T. candida,** *DC. Prodr.* ii. 249; *Wall. Cat* 5627; *W. & A. Prodr.* 210. Robinia candida, *Roxb. Fl. Ind.* iii. 327. Galega arborescens, *Herb. Madras.* Kiesera sericea, *Reinw. in Miq. Flor. Ind. Bat.* i. 291. Xiphocarpus candidus, *Hassk. Pl. Rar. Jav.* 336.

HIMALAYAS, tropical zone, from KUMAON eastward to KHASIA and ASSAM, ascending to 5000 ft. in Sikkim. SILHET, CHITTAGONG, MARTABAN, and TENASSERIM.—DISTRIB. Malay isles.

A low shrub, with slender woody grooved branches clothed with brown or grey persistent velvety pubescence; stipules setaceous, ascending; leaves short-petioled, reaching 6–9 in. long; leaflets 19–25, ligulate, acute, $1\frac{1}{2}$–2 in. long, green glabrous above, grey and thinly silky beneath. *Racemes* copious, terminal and lateral, elongated, 6–9 in. long; lower several to a fascicle; pedicels silky, $\frac{1}{4}$–$\frac{1}{2}$ in. *Calyx* $\frac{1}{6}$–$\frac{1}{4}$ in., densely silky; teeth much shorter than the tube. *Corolla* $\frac{3}{4}$–1 in., reddish or white; standard densely silky. *Pod* 3–4 in. long, 10–15-seeded, slightly recurved, clothed with adpressed brown silky hairs; style flattened, silky.

SUBGEN. 3. **Reineria** (*Moench.*). Perennial herbs or shrubs. *Leaves* odd-pinnate or simple. *Calyx-teeth* narrow, cuspidate, as long as the tube.

3. **T. calophylla,** *Bedd. Ic. Plant. Ind. Or.* t. 166; herbaceous, glabrous, leaves simple, flowers in lax long terminal racemes.

East slope of the NILGHIRIS, alt. 3000 ft., *Beddome.*

Branches slender, angular, tough. *Leaves* oblanceolate, obtuse, rigidly coriaceous, 3–4 in. long, cuneate at the base; veins below and edges distinct, brown; stipules linear, minute; petiole angular, 1–$1\frac{1}{2}$ in. *Racemes* 6–9 in. long; bracts linear, very minute; pedicels 2–3 times the calyx. *Calyx* $\frac{1}{8}$ in.; teeth lanceolate, cuspidate, as long as the tube. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in.; standard downy on the back. *Pod* $2\frac{1}{4}$–3 in. long, recurved, glabrous, 8–10-seeded.

4. **T. tinctoria,** *Pers.*; *DC. Prodr.* ii. 252; shrubby, branches densely velvety, leaflets large 3–13 casually simple, flowers in copious long-peduncled congested racemes. *W. & A. Prodr.* 211; *Wt. Ic.* t. 388; *non Wall. Cat.* 5643. T. Heyneana, *Wall. Cat.* 5631. Galega Heyneana, *Roxb. Fl. Ind.* iii. 384. T. hypargyræa, *DC. Prodr.* ii. 253. T. nervosa, *Pers.*; *DC. Prodr.* ii. 254.

WESTERN PENINSULA and CEYLON, ascending to 5000 ft.

An undershrub, with flexuose woody twiggy branches, densely clothed with brown or grey velvety pubescence. *Leaves* subsessile, very variable; leaflets usually 3–6-

jugate (reduced to one in T. Grahami, *Wall. Cat.* 5652), oblong, obtuse, subcoriaceous, the end one much larger than the others, 2–3 in. long, $\frac{3}{4}$–1 in. broad, green, glabrous above, clothed with persistent white silky pubescence beneath, the nerves prominent; stipules lanceolate, ascending. *Peduncles* often exceeding the leaves; racemes closely 3–12-flowered; flowers casually also in the axils of the leaves; pedicels very short. *Calyx* $\frac{1}{6}$ in., densely silky; teeth long, setaceous. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in., pale red, silky. *Pod* slightly recurved, 2–2$\frac{1}{2}$ in. long, 10–12-seeded, glabrescent. *Style* flattened, bearded throughout.

VAR. 1. *pulcherrima;* leaflets large (end one 3 in. long) coriaceous often solitary, veins below very prominent, bracts ovate-lanceolate, flowers few close, pod persistently velvety. T. pulcherrima, *Wight MSS.* Nilghiris and Ceylon.

VAR. 2. *coccinea;* leaflets 1–5 $\frac{3}{4}$–1 in. broad cuneately narrowed in the lower half, branches closely argenteo-canescent, bracts linear minute, racemes elongated. T. coccinea, *Wall. Cat.* 5633; *Pl. As. Rar.* t. 60. Birma, *Wallich.*

VAR. 3. *intermedia, W. & A.;* branches velvety, leaflets much smaller 9–13 $\frac{1}{4}$–$\frac{1}{2}$ in. broad the end one not much larger than the others, the veins less prominent; racemes not so close as in the type. T. intermedia, *Grah. in Wall. Cat.* 5632. Western Peninsula and Ceylon.

5. **T. spinosa,** *Pers.*; *DC. Prodr.* ii. 254; shrubby, branches closely argenteo-canescent, stipules spiny, flowers 1–2 all in the axils of the leaves. *Wall. Cat.* 5651. *W. & A. Prodr.* 214 (*excl. syn.*); *Wight Ic.* t. 372. Galega spinosa, *Linn.*; *Roxb. Fl. Ind.* iii. 383.

Plains of the WESTERN PENINSULA and CEYLON.—DISTRIB. Java.

A low shrub, with very numerous terete flexuose ascending branches. *Spines* spreading, $\frac{1}{8}$–$\frac{1}{4}$ in. *Leaves* short-petioled, $\frac{1}{2}$–1 in. long; leaflets 5–7, narrow-oblanceolate, rigidly subcoriaceous, truncate, often emarginate, glabrous above, glaucous, nearly glabrous below. *Flowers* all axillary; 1–2 rarely 3 from the nodes; pedicels $\frac{1}{12}$–$\frac{1}{8}$ in. *Calyx* $\frac{1}{8}$ in., teeth linear-acuminate, as long as the tube. *Corolla* red, twice the calyx. *Pod* $\frac{3}{4}$–1 in., nearly glabrescent, recurved, 5–6-seeded. *Style* much incurved, flattened, glabrous.

6. **T. senticosa,** *Pers.*; *DC. Prodr.* ii. 254; shrubby, branches closely argenteo-canescent, stipules not spiny, flowers 1–2 all in the axils of the leaves. *W. & A. Prodr.* 211; *Wight Ic.* t. 370; *Dalz. & Gibs. Bomb. Fl.* 61. Galega senticosa, *Linn. Amœn.* iii. 19. G. pentaphylla, *Roxb. Fl. Ind.* iii. 384. T. pentaphylla, *Grah. in Wall. Cat.* 5650. T. elegans, *Wall. Cat.* 5634.

Plains of the WESTERN PENINSULA and CEYLON; BIRMA, *Wallich.*

A low shrub, with copious erecto-patent terete slender branches; petiole very short; stipules minute, ascending, setaceous; leaflets usually 5, rarely 3, narrow-oblanceolate, 1–1$\frac{1}{4}$ in. long, truncate or emarginate, green, glabrous above, thinly silky beneath, cuneately narrowed in the lower half. *Flowers* usually geminate; pedicels $\frac{1}{8}$ in., argenteous. *Calyx* $\frac{1}{8}$ in.; teeth linear, as long as the tube. *Corolla* more than twice the calyx, argenteous. *Pod* 1$\frac{1}{2}$–2 in. long, 6–8-seeded, much recurved, persistently thinly canescent.

7. **T. purpurea,** *Pers.*; *DC. Prodr.* ii. 251; herbaceous, stems glabrescent or finely downy, racemes elongated, pod glabrescent or finely downy slightly recurved 6–10-seeded. *Wall. Cat.* 5638; *W. & A. Prodr.* 213; *Dalz. & Gibs. Bomb. Fl.* 61. T. leptostachya, *DC. loc. cit.* Galega purpurea, *Linn.*; *Roxb. Fl. Ind.* iii. 386. G. lanceæfolia, *Roxb. Fl. Ind.* iii. 386. G. Colonila and sericea, *Ham. in Linn. Trans.* xiii. 544–5. G. tinctoria, *Lamk.*; *Roxb. Fl. Ind.* iii. 386, *non L.* T. stricta, *Grah. in Wall. Cat.* 5639. T. Taylorii, *Grah. in. Wall. Cat.* 5637. T. Wallichii, *Grah. in Wall. Cat.* 5640. T. lobata, *Grah. in Wall. Cat.* 5646. T. tinctoria, *Grah. in Wall. Cat.* 5643. T. gale-

goides, Grah. in Wall. Cat. 5649. T. lanceæfolia, *Link*; *DC. loc. cit.* T. indigofera, *Bert. Misc.* xix. 9, t. 5. T. lanceolata, *Grah. in Wall. Cat.* 5636. Indigofera flexuosa, *Grah. in Wall. Cat.* 5473—*Rheede Hort. Mal.* i. t. 55.

Tropical zone, spread universally from the HIMALAYAS to CEYLON, MALACCA and SIAM, ascending to 4000 ft. in the north-west.—DISTRIB. Everywhere in the Tropics.

A copiously-branched suberect perennial, 1–2 ft. high, with slender firm terete stems. *Leaves* short-petioled, 3–6 in. long; stipules linear-subulate, ascending or reflexed; leaflets 13–21, narrow oblanceolate, obtuse, green, glabrescent above, glaucous, obscurely silky below. *Racemes* copious, all leaf-opposed, 3–6 in. long, lax; lower flowers fascicled; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in.; bracts minute. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in., closely silky; teeth linear-subulate, as long as the tube. *Corolla* $\frac{1}{4}$–$\frac{3}{8}$ in., red, thinly silky. *Pod* $1\frac{1}{2}$–2 in. by $\frac{1}{6}$ in. broad; style subglabrous, penicillate at the tip.

VAR. 1. *maxima;* taller, suberect, stipules lanceolate reflexed, racemes many-flowered elongated, corolla $\frac{1}{2}$ in. long, pod glabrescent 2–$2\frac{1}{4}$ in. long 10–12-seeded. T. maxima, *Pers.; DC. Prodr.* ii. 252. *W. & A. Prodr.* 213. Galega maxima, *Linn. Sp. Pl.* 1063. T. Mitchellii, *Grah. in Wall. Cat.* 5641.—Plains of the Western Peninsula and Ceylon.

VAR. 2. *pumila;* lower, more diffuse, persistently finely downy, stipules linear-setaceous, leaflets 9–11 smaller more downy, corolla rather smaller, pod 1–$1\frac{1}{2}$ in. long finely downy. T. pumila, *Pers.; DC. Prodr.* ii. 254. T. timoriensis, *DC. Prodr.* ii. 254. T. diffusa, *W. & A. Prodr.* 213. Galega diffusa, *Roxb. Fl. Ind.* iii. 387. G. procumbens, *Ham. in Trans. Linn. Soc.* xiii. 547. T. parviflora, *Wight in Wall. Cat.* 5642.—Distribution of the type.

8. **T. Hookeriana,** *W. & A. Prodr.* 212; herbaceous, stems finely downy, racemes elongated, pod slightly recurved 8–10-seeded clothed with persistent brownish silky hairs. T. Colutea, *Wight.*; *Wall. Cat.* 5647. Galega hirta, *Ham. in Trans. Linn. Soc.* xiii. 546. T. amœna, *Hort. Calc. non Pers.*

Plains from the HIMALAYAS to CEYLON and MALACCA.

Closely allied to *T. purpurea*, from which it scarcely differs except in the vestiture of the pod. *Stipules* linear; leaflets 13–19, narrow oblanceolate, $\frac{3}{4}$–1 in. long, truncate or emarginate, glabrescent above, thinly persistently silky below. *Racemes* all lateral, reaching 6–9 in. long; pedicels $\frac{1}{12}$–$\frac{1}{8}$ in. *Calyx* densely silky, $\frac{1}{6}$–$\frac{1}{5}$ in.; teeth setaceous, exceeding the tube. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in. *Pod* $1\frac{1}{2}$–2 in. by $\frac{1}{6}$ in.; style flattened, subglabrous, penicillate at the tip.

9. **T. villosa,** *Pers.*; *DC. Prodr.* ii. 251; herbaceous, stems finely downy, racemes elongated, pod much recurved 6–8-seeded densely clothed with white silky hairs. *Wall. Cat.* 5645; *W. & A. Prodr.* 212. Galega villosa, *Linn.*; *Roxb. Fl. Ind.* iii. 385. T. argentea, *Pers.*; *DC. Prodr.* ii. 252; *W. & A. Prodr.* 212. Galega argentea, *Lamk. Dict.* ii. 599. G. Barba-jovis, *Burm. Fl. Ind.* 172.

Plains from the HIMALAYAS to CEYLON.—DISTRIB. Mauritius, Trop. Africa.

Habit of *T. purpurea*, but stems somewhat firmer and more woody, clothed with short adpressed white hairs. *Leaves* nearly sessile, 2–3 in. long; stipules linear, ascending or reflexed; leaflets 13–19, grey-green, glabrescent above, persistently silky below, narrow oblanceolate, often emarginate. *Racemes* half a foot or more long; lower flowers in distant fascicles, lowest often in the axils of the leaves; pedicels very short; bracts setaceous, plumose. *Calyx* $\frac{1}{5}$–$\frac{1}{4}$ in. deep, densely silky; teeth setaceous, lower exceeding the tube. *Corolla* pale red, not much exceeding the calyx. *Pod* 1–$1\frac{1}{4}$ in. long, $\frac{1}{6}$–$\frac{1}{5}$ in. broad, densely persistently velvety; style glabrous, flattened, densely penicillate at the tip.

VAR. 1. *incana*; stems clothed with short spreading pubescence, leaflets rather broader, pod still more densely silky. T. incana, *Grah. in Wall. Cat.* 5644;

W. & A. Prodr. 212; *Wt. Ic.* t. 371. Galega incana, *Roxb. Fl. Ind.* iii. 385. G. Colutea, *Willd. Sp. Pl.* iii. 1246 (*excluding description of pod*). T. Ehrenbergiana, *Schweinf. Pl. Æthiop.* 18.—Distribution of the type.

10. **T. pauciflora,** *Grah. in Wall. Cat.* 5635; herbaceous, stems finely silky, flowers usually all in the axils of the leaves, pod glabrescent or finely downy slightly recurved 6–8-seeded. T. anthylloides, *Hochst.*; *Baker in Oliv. Flor. Trop. Africa,* ii. 118?

Plains of SCINDE, *Stocks, Dalzell*; PUNJAB, *Stewart*; BIRMA, *Wallich.*

Stems densely cæspitose, under a foot high. *Stipules* ascending, setaceous; leaflets 5–9, narrow oblanceolate, finely silky beneath, 1–1¼ in. long, often emarginate. *Flowers* usually all geminate on short pedicels in the axils of the upper leaves, casually produced into a sparse raceme. *Calyx* ⅛ in., finely silky. *Corolla* red, twice the calyx. *Pod* 1–2 in. by ⅙ in.; style glabrous, flattened.—Probably a third variety of *T. purpurea.* The Indian differs from the African plant by smaller flowers and fewer seeds.

DOUBTFUL SPECIES.

T. FUSCA, *W. & A. Prodr.* 210 (T. argentea, *Wight in Wall. Cat.* 5648, *non Pers.*), is a plant gathered by Dr. Wight on the Dindygul hills, of which the flowers are not known. In general habit, leaves, inflorescence, vestiture, and the shape of the calyx and pod, it resembles closely *Mundulea suberosa,* but the leaflets are shorter and more obtuse, and the pod dehisces readily, like that of a *Tephrosia,* and the sutures are not thickened so as to form a prominent border. The calyx is that of § *Brissonia.*

23. SESBANIA, Pers.

Soft-wooded shrubs or herbs. *Leaves* long, very narrow, abruptly-pinnate, with very numerous deciduous linear-oblong obtuse mucronate leaflets. *Flowers* in axillary racemes. *Calyx* campanulate, shallowly 2-lipped or 5-toothed. *Corolla* much exserted; petals all with long claws; standard broad; keel obtuse, straight, or in § *Agati* recurved and subrostrate. *Stamens* diadelphous; anthers uniform. *Ovary* linear, stipitate, many-ovuled; style filiform, incurved, glabrous, stigma capitate. *Pod* very long and narrow, dehiscent, with distinct septa between the very numerous seeds.—DISTRIB. Species about 20, spread everywhere through the tropics.

SUBGEN. 1. **Eusesbania.** *Flowers* small; bud straight.

1. **S. ægyptiaca,** *Pers.*; *DC. Prod.* ii. 264; perennial, unarmed, pod flexible twisted. *Wall. Cat.* 5656; *W. & A. Prodr.* 214; *Wt. Ic.* t. 32; *Bedd. Fl. Sylv.* 86, *Anal. Gen.* t. 12, fig. 3; *Brand. For. Flor.* 137; *Boiss. Fl. Or.* ii. 193. Æschynomene Sesban, *Linn.*; *Roxb. Fl. Ind.* iii. 332. Æ. indica, *Burm. Fl. Ind.* 169. Coronilla Sesban, *Willd. Sp.* iii. 1147—*Rheede Hort. Mal.* vi. t. 27.

Plains from the HIMALAYAS to CEYLON and SIAM, ascending to 4000 ft. in the north-west.—DISTRIB. Cosmopolitan in tropics of old world.

A soft-wooded shrub of short duration, 6–10 ft. high, with terete twiggy branches. *Leaves* 3–6 in. long; leaflets 21–41, glabrous, linear-oblong, pale green. *Flowers* 6–10, in copious lax axillary racemes; pedicels filiform, ⅙–¼ in. *Calyx* ⅛ in., glabrous, membranous; teeth short, deltoid. *Corolla* ½–¾ in., glabrous, pale yellow or (in *S. picta, Pers.*; *Bot. Reg.* t. 873), more or less tinged with deep red. *Pod* 6–9 in. long, weak, torulose; sutures little thickened.

2. **S. aculeata,** *Pers.*; *DC. Prodr.* ii. 265; annual, muricated, pod long firm not twisted nor torulose. *Wall. Cat.* 5655; *W. & A. Prodr.* 214; *Dalz. &*

Gibs. Bomb. Fl. 62. Æschynomene bispinosa, *Jacq. Ic.* t. 564. Æ. spinulosa, *Roxb. Fl. Ind.* iii. 333. Coronilla aculeata, *Willd. Sp. Pl.* iii. 1147.

Plains from the WEST HIMALAYAS to CEYLON and SIAM.—DISTRIB. Cosmopolitan in tropics of old world.

Suffruticose, reaching several feet high, the branches and leaf-rachises armed with small weak prickles. *Leaves* reaching ½–1 ft. long; leaflets glabrous, 41–81, smaller and narrower than in *S. ægyptiaca*. *Racemes* laxly 3–6-flowered, distinctly peduncled. *Calyx* ⅛ in., glabrous. *Corolla* ⅜–½ in., pale yellow; standard dotted with red. *Pod* 6–9 in. by ⅛ in., straight or rather falcate, beaked with the persistent style.

VAR. 1. *paludosa*; more robust, unarmed, leaves glabrous. Æ. paludosa and uliginosa, *Roxb. Fl. Ind.* iii. 333-4.

VAR. 2. *sericea*; branches robust unarmed, leaflets more or less silky even when mature, racemes subsessile. S. sericea. *DC. Prodr.* ii. 266—Plains of Ceylon, *Ferguson, CP.*, 3850.

VAR. 3. *cannabina*; branches obscurely muricated, racemes subsessile 3–4-flowered, corolla and calyx smaller, the former not more than ¼ in. long. S. cannabina, *Pers.*; *DC. Prodr.* ii. 215; *W. & A. Prodr.* 215; *Wall. Cat.* 5657. Æschynomene cannabina, *Retz. Obs.* v. 26. Coronilla cannabina, *Willd. Sp. Pl.* iii. 1148. S. affinis, *Schrad.*; *DC. loc. cit.*

3. **S. procumbens,** *W. & A. Prodr.* 215; annual, obscurely muricated, pod short flexible torulose not twisted. *Dalz. & Gibs. Bomb. Fl.* 62. Æschynomene procumbens, *Roxb. Fl. Ind.* iii. 337. Æ. diffusa, *Roxb. MSS.*

PLAINS of the WESTERN PENINSULA.

Branches lower and more slender than in the last. *Leaves* 2–3 in. long; leaflets 31–41, linear-oblong, glabrous, glaucous. *Flowers* solitary or geminate, without a common peduncle. *Calyx* $\frac{1}{12}$ in. long. *Corolla* 3 times the calyx. *Pod* straight, 2–3 in. long, $\frac{1}{12}$ in. thick, 15–20-seeded, distinctly torulose.

SUBGEN. 2. **Agati,** *Desv.* *Flowers* large; bud falcately recurved.

4. **S. grandiflora,** *Pers. Syn.* ii. 316; *Bedd. Fl. Sylv.* 86; *Brand. For. Flor.* 137. Æschynomene grandiflora, *Linn. Sp.* 1050; *Roxb. Fl. Ind.* iii. 331. Agati grandiflora, *Desv.*; *DC. Prodr.* ii. 266; *Wall. Cat.* 5654; *W. & A. Prodr.* 215. Coronilla grandiflora, *Willd. Sp.* iii. 1145—*Rheede Hort. Mal.* i. t. 51.

PLAINS of the Western Peninsula, a doubtful native.—DISTRIB. Mauritius to N. Australia, but often cultivated.

A short-lived soft-wooded tree, 20–30 ft. high, with virgate terete branches. *Leaves* ½–1 ft. long; leaflets 41–61, linear-oblong, pale green, glabrous. *Flowers* 2–4, in short axillary racemes. *Calyx* 1 in. deep, glabrous, shallowly 2-lipped. *Corolla* 3–4 in. deep, white or, in *Æ. coccinea, Desv.*; *DC. loc. cit.* (Æschynomene coccinea, *L.*), more or less deeply tinged with red. *Pod* 1 foot or more long, falcate, firm, not torulose, the sutures much thickened.

24. CARAGANA, Lam.

Usually low shrubs, with the leaf-rachises and the stipules usually spine-tipped and hardened, persistent from year to year. *Calyx* campanulate, placed very obliquely on its pedicel, produced on the upper side; teeth 5, deltoid or lanceolate. *Corolla* much exserted; standard broad, with reflexed edges; keel not at all beaked, usually as long as the wings and standard. *Stamens* diadelphous; anthers uniform. *Ovary* linear, sessile, many-ovuled; style filiform, incurved, glabrous, stigma minute terminal. *Pod* linear, turgid, not at all torulose, continuous, but sometimes pubescent within.—DISTRIB. Species about 15, spread widely through Central Asia.

* *Leaf-rachis suppressed.*

1. **C. pygmæa,** *DC. Prodr.* ii. 268; leaflets 4 digitate oblanceolate glabrous, flowers solitary nearly sessile. *Brand. For. Flor.* 134. Robinia pygmæa, *Linn. Sp. Pl.* 1044; *Pall. Fl. Ross,* i. t. 45. Genista versicolor, *Wall. Cat.* 5922; *Royle Ill.* t. 34, fig. 2. C. versicolor, *Benth. in Royle Ill.* 198.

WEST HIMALAYAS, temperate and alpine regions; TIBET, KUNAWAR, &c., alt. 8–17,000 ft.—DISTRIB. Afghanistan, Altai to Davuria.

A low undershrub, with the habit of a prickly *Genista*, the branches armed with a pungent, ascending trifid spine under an inch long from each of the close nodes. *Leaves* solitary or geminate in the spine axils, with rarely a perceptible petiole; leaflets $\frac{1}{8}$–$\frac{1}{2}$ in. long, firm, pale green. *Pedicels* jointed, shorter than the calyx. *Calyx* glabrous, $\frac{1}{4}$ in. long; teeth short, deltoid. *Corolla* bright reddish-yellow, $\frac{3}{4}$ in; standard glabrous. *Pod* linear, turgid, glabrous, naked within, $\frac{3}{4}$–1 in. long.

** *Leaf-rachis produced, with a spine at the end.*

2. **C. conferta,** *Benth. MSS.*; leaflets 4–6 oblanceolate subglabrous, stipules spinous, flowers 1–2 subsessile.

BALTI, temperate or alpine region, *Winterbottom.*

Nodes crowded on the castaneous downy branches. *Spines* woody, an inch long. *Stipules* broad, scariose, downy, with a spiny tip; leaflets $\frac{1}{2}$–$\frac{5}{8}$ in. long, obtuse, with a mucro, at first faintly silky beneath, subcoriaceous. *Pedicels* downy, shorter than the calyx. *Calyx* $\frac{3}{8}$ in., finely silky; teeth deltoid, ciliated, half as long as the tube. *Corolla* 1 in. long, the keel incurved, with very long claws. *Ovary* linear, densely pubescent, 10–15-ovuled; style long, much incurved. *Pod* unknown.

3. **C. Gerardiana,** *Royle Ill.* 198, t. 34, fig. 1; leaflets 8–12 oblanceolate-oblong densely pubescent, stipules not spinous, flowers 1–2 subsessile. *Brand. For. Flor.* 133. Astragalus Gerardianus, *Grah. in Wall. Cat.* 5938. C. spinosissima, *Benth. in Royle Ill.* 198; *Camb. in Jacquem. Voy. Bot.* t. 43.

WEST HIMALAYAS, temperate and alpine region, alt. 8–13,000 ft.; GURWHAL, KUMAON, KUNAWAR,

A shrub reaching 3–4 ft. high, with very close nodes and downy young branches. Old *spines* erecto-patent, pungent, 1–1$\frac{1}{2}$ in. long, often downy. *Leaflets* $\frac{1}{4}$–$\frac{3}{8}$ in. long, obtuse, mucronate, firm, densely silky; stipules deltoid, scarious, not spine-tipped and consequently the old spines simple, not trifid. *Calyx* shortly pedicelled, $\frac{3}{8}$ in. long, densely pubescent; teeth deltoid-cuspidate, half the tube. *Corolla* twice the calyx. *Pod* $\frac{3}{4}$–1 in by 1 in., woolly within and persistently clothed with grey pubescence on the outside.

4. **C. polyacantha,** *Royle Ill.* 198; leaflets 10–12 obovate-oblong densely pubescent, stipules spinous, flowers 1–2 on a short peduncle. Astragalus polyacanthus, *Wall. Cat.* 5934.

CENTRAL HIMALAYA, alpine or temperate region; KUMAON, *Blinkworth; Gurwhal, Strachey and Winterbottom.*

A low shrub, with close nodes and densely downy young branches. Old *spines* 1–2 in. long, weaker and less pungent than in the last. *Leaf*-rachises densely matted with pale brown woolly pubescence; leaflets $\frac{1}{4}$–$\frac{3}{8}$ in. long, pale green, rigidly coriaceous, truncate, mucronate. Common *peduncle* short and not always developed. *Calyx* $\frac{3}{8}$ in. long, densely silky, subtended by a pair of linear bracteoles; teeth setaceous from a deltoid base, half as long as the tube. *Corolla* yellowish, twice the calyx. *Ovary* linear, densely pubescent. *Pod* unknown.

5. **C. brevispina,** *Royle Ill.* 198; leaflets 12–16 obovate-oblong glabrous or finely silky, stipules spinous, flowers 2–4 on a common peduncle. *Brand. For. Flor.* 133.

WEST HIMALAYAS, temperate region, alt. 5–9000 ft.; KASHMIR, KUNAWAR, GURWHAL, SIMLA, &c.—DISTRIB. Chinese Tartary, Afghanistan.

A shrub several feet high, the nodes less crowded than in the preceding, the young branches finely downy. Old spine-tipped *rachises* 2–4 in. long, rigid or flexible. *Leaflets* $\frac{3}{8}$–$\frac{3}{4}$ in. long, subcoriaceous, glabrescent on both sides or thinly pubescent below. *Peduncle* 1–2 in.; bracts and bracteoles linear, scarious; pedicels downy. *Calyx* $\frac{1}{2}$ in. long, subglabrous; teeth half the tube, lanceolate-cuspidate. *Corolla* glabrous, yellowish, twice the calyx. *Pod* glabrous, linear, 2 in. long, woolly within.

*** *Spineless leaf-rachis produced, with a leaflet at the end* (CHESNEYA, *Lindl.*).

6. **C. crassicaulis,** *Benth. MSS.*; leaflets 21–25 linear-oblong pubescent, flowers solitary. Astragalus crassicaulis, *Grah. in Wall. Cat.* 5932. A. nubigenus, *Don Prodr.* 245? Caragana (Nephelotrophe) nubigena, *Bunge Mon. Astrag.* 240?

HIMALAYAS, alpine region, alt. 12–17,000 ft.; GURWHAL and KUMAON to SIKKIM.

Stems thick, tufted, woody, creeping for a few inches below the surface, clothed very densely with the long old tough but not pungent or spinous leaf-rachises. *Leaves* in a lax rosette at the surface, short-petioled, 1–1$\frac{1}{2}$ in. long; leaflets green, not coriaceous, $\frac{1}{8}$–$\frac{1}{4}$ in. long, truncate or emarginate. *Peduncle* downy, as long as the calyx. *Calyx* $\frac{1}{2}$ in. long, very oblique, densely pubescent; teeth $\frac{1}{2}$-$\frac{1}{3}$ tube. *Corolla* reddish-yellow, twice the calyx; standard pubescent on the outside; wings and keel shorter. *Pod* linear-oblong, $\frac{5}{8}$–$\frac{3}{4}$ in. long, finely pubescent, stuffed inside with cottony down.

7. **C. cuneata,** *Baker*; leaflets 11–13, flowers 1–3 long-peduncled. Guldenstædtia cuneata, *Benth. in Royle Ill.* 200. Chesneya vaginalis, *Jaub. and Spach. Ill.* 96, t. 48? (calyx teeth shorter).

TEMPERATE and ALPINE WEST HIMALAYAS, alt. 8–13,000 ft.; TIBET and KUNAWAR.—DISTRIB. Orient?; Kashgar, *Bellew.*

Branches 2–3 in. long, crowded from a woody rhizome. *Stipules* small, deltoid; leaf-rachis, including distinct petiole, 2–4 in. long; leaflets obovate, $\frac{3}{8}$–$\frac{5}{8}$ in. long, truncate, emarginate, not coriaceous, densely pubescent. *Peduncle* equalling or overtopping the leaves; pedicels very short. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in. downy; teeth linear-lanceolate, half as long as the tube or more. *Corolla* twice the calyx; standard pubescent; wings rather shorter; keel shorter still. *Pod* straight, linear, glabrous, 2–2$\frac{1}{4}$ in. long, 10–12-seeded, slightly stuffed within. This and the last have the oblique calyx of *Calophaca*, but in habit and corolla range better under *Guldenstædtia.*—Dr. Aitchison sends from Ladak a plant with deep purple flowers, more hoary leaves and narrower pod, which may be distinct.

25. GULDENSTÆDTIA, Fisch.

Spineless perennials. *Leaves* odd-pinnate. *Flowers* solitary or umbellate on long axillary peduncles. *Calyx-tube* campanulate, not oblique; teeth 5, distinct, upper broader. *Corolla* much exserted; standard round; keel not more than half as long as the other petals, straight, obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, many-ovuled; style incurved very short, stigma capitate. *Pod* linear, turgid, not torulose, continuous within.—DISTRIB. Species 7–8, all Central Asian.

1. **G. himalaica,** *Baker*; shortly caulescent, leaflets 11–13 obovate-obcordate densely silky, flowers 1–3, calyx-teeth much shorter than the tube.

HIMALAYA, alpine zone, alt. 11–15,000 ft.; KUMAON and GURWHAL to SIKKIM.

Stems 1–2 in. long, cæspitose from a perennial rootstock, densely silky. *Leaves* $\frac{1}{2}$–1$\frac{1}{2}$ in. long, distinctly petioled, densely clothed with pale brown silky hairs; stipules

large, leafy, ovate; leaflets $\frac{1}{8}$–$\frac{1}{4}$ in. long, not at all rigid. *Peduncle* filiform, 1–3 in. long; pedicels shorter than calyx; bracts lanceolate, very minute. *Calyx* $\frac{1}{8}$ in., silky; upper teeth deltoid, lower lanceolate. *Corolla* 3–4 times calyx; standard round, glabrous. *Pod* linear, glabrous, $\frac{1}{2}$ in. long, 6–8-seeded, with a narrow border to the upper suture.

2. **G. mirpourensis,** *Benth. MSS.*; stemless, leaflets 3–7 oblong obscurely pubescent, flowers 1–3, calyx-teeth as long as the tube. Astragalus mirpourensis, *Camb. in Jacquem. Voy. Bot.* 39, t. 46.

UPPER GANGETIC plain at Mirpour, *Jacquemont*. HAZARA, *Dr. Stewart.*

Rhizomes slender, branched, with the leaves and peduncles in a rosette at the surface. *Petiole* $\frac{1}{2}$–1 in., obscurely pubescent, like the rachis and underside of the leaves; leaflets $\frac{1}{4}$–$\frac{1}{2}$ in. long, obtuse, glabrescent above, not at all rigid. Peduncle as long as the leaves; pedicels scarcely any. *Calyx* $\frac{1}{4}$ in. finely silky; teeth lanceolate-acuminate. *Corolla* twice the calyx. *Pod* twice the calyx, linear, finely silky.

3. **G. multiflora,** *Bunge Enum. Pl. Chin.* 18; stemless, leaflets 11–13 oblong densely silky, flowers 3–6, calyx-teeth as long as the tube.

WEST HIMALAYA, *Royle*, the exact station not known. DISTRIB. China.

Rosettes of leaves and peduncles densely crowded at the surface on a slender woody rhizome. *Leaf*-rachis 2–4 in., including the distinct petiole, densely pubescent; leaflets $\frac{1}{4}$–$\frac{1}{2}$ in., obtuse, soft, not rigid. *Peduncle* equalling or overtopping the leaves; bracts linear, exceeding the very short pedicels. *Calyx* $\frac{1}{4}$ in.; teeth linear-lanceolate. *Corolla* violet or yellow, twice the calyx. *Pod* twice the calyx, linear, straight, densely pubescent.

26. ASTRAGALUS, Linn.

Herbs or undershrubs with pinnate leaves, the leaf-rachis terminating either in a leaflet or a spine. *Calyx* tubular or campanulate, equal or gibbous on the back; teeth 5, subequal. *Corolla* usually distinctly exserted; petals subequal or wings and keel shorter than the standard, the keel incurved, obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* sessile or stalked, many-ovuled; style incurved, stigma capitate. *Pod* linear or oblong, usually turgid, continuous within or more or less completely longitudinally 2-celled from the introversion of the inferior suture.—DISTRIB. Belts the world in the north-temperate zone, the head quarters being Western and Central Asia. Monographed in the 11th volume of the 7th series of the Memoirs of the Imperial Academy of St. Petersburg, by Bunge, who estimates the number of species at 1150–1200.

SUBGEN. 1. **Trichostylus,** *Baker*. A herbaceous perennial, with basifixed hairs, the style bearded down the inner face below the stigma, as in *Phaseolus*.

26043 1. **A. Heydei,** *Baker*.

WEST TIBETAN HIMALAYAS, alpine region, alt. 15–16,000 ft., *Strachey*. By the Tso-kar sea, between Rupschu and Korsog, *Heyde*.

Rhizome slender, woody, the whole plant not reaching more than an inch above the soil. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ in. long; leaflets 17–19, oblong, crowded, complicate, persistently argenteo-canescent, fleshy; stipules small, deltoid, fleshy, spreading. *Peduncles* $\frac{1}{4}$–$\frac{1}{2}$ in. *Flowers* 2–4 in a close umbellate head; bracts and pedicels minute. *Calyx* $\frac{1}{8}$ in., densely argenteo-canescent; teeth lanceolate-deltoid, rather shorter than the campanulate tube. *Corolla* more than twice the calyx, rose-red with the tip deeper; petals subequal; limb of standard round, reflexed, deeply emarginate. *Pod* $\frac{1}{2}$ in, long, oblong, membranous, much inflated, short-stalked, glabrous, 1-celled, many-seeded.

SUBGEN. 2. **Pogonophace,** *Bunge*. A group of various habit, with basifixed hairs, differing from all the rest by its penicillate stigma.

* *Annuals with slender trailing stems and sessile pods* (habit of Subgen. Trimenïæus).

2. **A. amherstianus,** *Benth. in Royle Ill.* 199; corolla scarcely exceeding the calyx, pod 10–12-seeded with the valves but little inflexed. *Bunge Mon.* i. 5, ii. 3.

West Himalayas, temperate region, alt. 6–10,000 ft.; KISTWAR, KUNAWAR, CHAMBA, SIMLA.—DISTRIB. Afghanistan.

Stems densely cæspitose, diffuse, ½–1 ft., clothed with dense adpressed whitish hairs. *Leaves* short-petioled, 1–1½ in.; leaflets 13–17, narrow, oblong, obtuse, ⅛–⅜ in. long, densely clothed with thick adpressed white hairs; stipules minute, lanceolate. *Flowers* 4–10, in close distinctly-peduncled racemes; pedicels very short; bracts minute, setaceous. *Calyx* ⅙–⅕ in., shaggy with hairs like those of the leaves; teeth setaceous, as long as the tube. *Corolla* primrose-yellow. *Pod* linear, turgid, ⅜–½ in. long, much recurved, rostrate, thinly pubescent.

3. **A. subumbellatus,** *Klotzsch in Reise Pr. Wald. Bot.* 159, t. 3; corolla more than twice as long as the calyx, pod 20–24-seeded with the sutures much inflexed. A. hippocrepidis, *Benth. MSS.*; *Bunge Mon.* i. 5, ii. 3; *Boiss. Fl. Orient.* ii. 231. A. Scorpiurus, *Bunge Mon. loc. cit.* A. humifusus, *Jacquem. MSS.*

PUNJAB, HAZARA, KASHMIR, tropical and temperate regions, ascending to 6–7000 ft.—DISTRIB. Beloochistan, Afghanistan.

Stems ¼–1 ft., diffuse, branched, clothed with short deciduous ascending white hairs. *Leaves* 1–2 in.; leaflets 13–21, distant, oblong, glaucous, ⅛–⅜ in., thinly or densely pilose or nearly glabrescent; stipules minute, lanceolate, cuspidate. *Racemes* distinctly peduncled, 6–10-flowered, lax or close; pedicels very short; bracts setaceous, very minute. *Calyx* ⅛ in., thinly pubescent; teeth setaceous, as long as the tube. *Corolla* ⅜ in., yellow tinged with rose-purple; blade of wings lanceolate, shorter than the standard and keel. *Pod* ½–¾ in., cylindrical, much recurved, shortly pubescent, almost completely bilocular.

** *Perennials with slender cæspitose trailing stems and stalked pods* (habit of Subgen. Hypoglottis).

4. **A. pycnorhizus,** *Wall. Cat.* 5927; glabrous, flowers 1–2, calyx-teeth lanceolate nearly as long as the tube, wings shorter than the keel. *Benth. in Royle Ill.* 199; *Bunge Mon.* i. 4, ii. 1. Sphærophysa pycnorhiza, *Benth. Gen. Plant.* i. 504.

NIPAL, *Wallich.* SIKKIM, alt. 6–12,000 ft., *Hook. fil.*

Root woody, fusiform. *Stems* wiry, ¼–1 ft. *Leaves* an inch or more long; leaflets close, 11–13, green, obovate-oblong, truncate-emarginate, ¼ in. long, clothed with only a few very short obscure hairs; stipules free, minute, membranous, deltoid. *Peduncles* equalling or exceeding the leaves, clothed with short mixed black and white hairs; pedicels very short; bracts membranous, lanceolate. *Calyx* ¾ in., gibbous, clothed with minute pubescence like that of the peduncle. *Corolla* ½–⅝ in., purplish; limb of standard round, ½ in. broad; wings half as broad as the depth of the keel. *Pod* ½–¾ in. long, glabrous, inflated, 12–16-seeded, the suture not inflexed; stalk much shorter than the calyx.

5. **A. Donianus,** *DC. Prodr.* ii. 283; slightly pubescent, flowers few, wings as long as the keel, calyx-teeth half as long as the tube. *Bunge Mon.* i. 4, ii. 1. A. macrorhizus, *Don Prod.* 245, *non Cav.*

NIPAL, *Wallich.*

Plant prostrate, beset with a few scattered adpressed hairs. *Leaves* with 8–10-pairs of oval alternate mucronulate leaflets, which are pubescent beneath, but when

young silky; stipules connate. *Peduncles* twice as long as the leaves. *Calyx* $\frac{1}{4}$ in. long. *Corolla* purple; standard $\frac{3}{8}$ in. long, blade broad. *Pod* silky, subulate, 20-seeded. Described from *DC. and Bunge loc. cit.*—No specimen seen.

6. **A. kongrensis,** *Benth. MSS.*; green, finely silky, flowers in a dense head, wings shorter than the keel, calyx clothed with adpressed silky hairs, teeth lanceolate much shorter than the tube.

SIKKIM; Kongra Lama, alt. 15,000 ft., *Hook. fil.*

Subacaulescent, with a slender rhizome, creeping below the surface. *Leaves* distinctly petioled, 2–3 in. long; leaflets 15–17, roundish-oblong, obtuse, not complicate, pale green, thinly coated with short white hairs; stipules $\frac{1}{4}$–$\frac{1}{3}$ in., ovate, obtuse, persistent, slightly silky. *Flowers* 5–6, ascending or cernuous, in a dense head; peduncles $1\frac{1}{2}$–2 in., erect, clothed with adpressed black hairs; pedicels very short, densely black-silky; bracts linear, not very small. *Calyx* $\frac{1}{3}$ in. *Corolla* twice the calyx, deep purple; keel as long as the standard. *Ovary* densely silky, multiovulate, with a stalk nearly as long as the calyx-tube.

7. **A. tribulifolius,** *Benth. MSS.*; glaucous, densely tomentose, leaflets crowded, flowers few in a dense head, calyx-teeth subulate as long as the tube, wings much shorter than the keel. *Bunge Mon.* i. 4, ii. 2.

WESTERN TIBET, alpine region; valley below Hanle Rupchu, alt. 14,500 ft.; *Thomson, Heyde.*

Rootstock long, woody, fusiform. *Stems* and thick glaucous leaves densely clothed with short spreading white hairs. *Leaves* 1–2 in. long; leaflets crowded, 17–21, oblong, $\frac{1}{4}$–$\frac{3}{8}$ in. long; stipules minute, deltoid, leaf-like, free. *Peduncles* 1–2 in., the short pubescence growing black upwards; pedicels very short; bracts subulate, conspicuous, persistent. *Calyx* $\frac{1}{4}$ in., densely clothed with short black pubescence. *Corolla* purplish, half as long again as the calyx; standard $\frac{1}{4}$ in. broad. *Ovary* silky, distinctly stalked; ovules about 20. *Pod* not seen.

16039 8. **A. Hendersoni,** *Baker*; glaucous, densely tomentose, leaflets crowded, flowers 1–2 together, calyx-teeth lanceolate shorter than the tube.

TIBET; upper part of the Karakash valley, *Dr. Henderson.*

Closely allied to the last, the thick glaucous crowded leaflets clothed with dense white hairs, the whole plant in the single specimen gathered not more than a couple of inches high. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ in. long; leaflets 13–17, obovate-oblong, obtuse, folded together. *Peduncles* short, clothed with short white pubescence. *Calyx* $\frac{1}{6}$ in., matted with mixed black and white hairs. *Corolla* seen in bud only. *Pod* oblong, the same size and shape, and as much inflated as in *A. pycnorhizus*, membranous, with a few short adpressed hairs and a short stalk; sutures scarcely at all intruded; seeds about 20.

*** *Tall perennials with almost woody stems, lax flowers, and long-stalked few-seeded pods* (habit of Subgen. Phaca).

9. **A. Falconeri,** *Bunge Mon.* i. 4; ii. 2; densely pubescent, stipules broad foliaceous, leaflets 13–17, pod turgid glabrescent. A. acutiflorus, *Benth. MSS.*

WEST TIBET, *Falconer*; HAZARA, *Winterbottom.*

Stems flexuous, old glabrescent, young clothed with short spreading white pubescence. *Leaves* 1–$1\frac{1}{2}$ in. long; leaflets close, glaucous, obtuse, oblanceolate-oblong, $\frac{1}{4}$–$\frac{1}{2}$ in. long. *Racemes* few-flowered, long-peduncled; pedicels shorter than the calyx, downy. *Calyx* $\frac{1}{6}$ in., gibbous, nearly glabrous; teeth very short. *Corolla* lilac, $\frac{1}{2}$ in.; wings lanceolate, acute, as long as the keel. *Pod* $\frac{1}{2}$–$\frac{5}{8}$ in. long, narrowed to both ends, 4–6-seeded; stalk twice the calyx; inflexed suture reaching all through in the lower part, not in the upper.

10. **A. adesmiæfolius,** *Benth. MSS.*; glabrous, stipules large foliaceous, leaflets very numerous, pod flat glabrous. *Bunge Mon.* i. 4; ii. 2. Phaca Hoffmeisteri, *Klotzsch Reise Pr. Wald. Bot.* 159, t. 2.

West Tibetan Himalayas, alt. 8–12,000 ft.; DRAS, ZANSKAR, PITI, LADAK, NUBRA.

Branches zigzag, glabrous, terete, woody, reaching several feet in height. *Leaves* 2–6 in. long; leaflets 25–41, green, obovate, emarginate, rather fleshy, lower $\frac{1}{8}$–$\frac{1}{4}$ in. long, upper growing gradually smaller; stipules persistent, obliquely cordate-ovate. *Racemes* very lax, $\frac{1}{2}$–1 ft.; pedicels very short; bracts minute, linear. *Calyx* $\frac{1}{6}$ in., oblique, tubuloso-campanulate, glabrous; teeth minute, deltoid. *Corolla* lilac, $\frac{3}{8}$ in., the petals subequal in length; limb of wing lanceolate, acute. *Pod* oblong, $\frac{3}{8}$–$\frac{1}{2}$ in., narrowed to both ends, 4–8-seeded; lower suture hardly at all inflexed; stalk more than twice the calyx.

11. **A. trichocarpus,** *Grah. in Wall. Cat.* 5926; obscurely silky, stipules minute, leaflets very numerous, pod turgid finely downy. *Bunge Mon.* i. 4; ii. 2. A. sesbanioides, *Benth. in Royle Ill.* 199; *Bunge loc. cit.*

Central Himalayas, temperate region, alt. 5–8000 ft.; SIMLA, GURWHAL, KUMAON.

Erect, suffruticose, reaching several feet high, the branches straight, virgate, much furrowed. *Leaves* subsessile, 2–4 in; leaflets 31–41, oblong, $\frac{1}{8}$–$\frac{3}{8}$ in. long, subobtuse, pale green, clothed with minute silvery hairs. *Racemes* very copious, distinctly peduncled, erecto-patent, 2–4 in. long, with very numerous flowers; pedicels short, cernuous, clothed with dense short mixed black and white hairs; bracts linear, minute. *Calyx* glabrous, campanulate, oblique, $\frac{1}{12}$ in.; teeth deltoid. *Corolla* lilac, 4–5 times the calyx; limb of standard round; wings lanceolate, shorter than the keel. *Pod* $\frac{3}{4}$–$\frac{7}{8}$ in. long, oblong, completely 2-celled, 4–6-seeded; stalk much exceeding the calyx.

SUBGEN. 3. **Trimeniæus,** *Bunge.* Annual weeds with basifixed hairs, small yellow flowers in usually dense heads, and glabrous stigmas.

12. **A. prolixus,** *Sieber Pl. Ægypt. Exsic.*; heads dense peduncled, leaflets 11-17 oblong obtuse, pod short straight linear-oblong 6–8-seeded nearly bilocular. *Bunge Mon.* i. 9; ii. 6; *Boiss. Fl. Orient.* ii. 223. A. arabicus, *Ehrhenb.*; *Bunge Mon. loc. cit.*; *Boiss. loc. cit.* Phaca Vogelii, *Webb in Hook. Nigr. Fl.* 123, t. 8.

Plains of SCINDE and PUNJAB.—DISTRIB. Cape Verde islands; through Egypt to Arabia.

Stems very slender, $\frac{1}{4}$–1 ft., densely clothed upwards with adpressed white hairs. *Leaves* distinctly petioled, $\frac{1}{2}$–1$\frac{1}{2}$ in. long; leaflets distant, glaucous, $\frac{1}{8}$–$\frac{1}{4}$ in., clothed with fine adpressed white hairs; stipules minute, lanceolate, free. *Heads* 6–12-flowered; peduncles rarely as long as the leaves. *Calyx* under $\frac{1}{12}$ in., densely matted; teeth linear-setaceous, nearly as long as the tube. *Corolla* little exserted. *Pod* sessile, turgid, $\frac{1}{4}$–$\frac{3}{8}$ in. long, densely pubescent.

13. **A. Aitchisoni,** *Baker*; heads very lax short-peduncled, leaflets oblong emarginate, pod very long and slender straight or slightly recurved slightly torulose unilocular 15–20-seeded.

PUNJAB, Salt range, *Aitchison.*

Stem suberect, $\frac{1}{2}$ ft., slender, thinly white-canescent. *Leaves* distinctly petioled, 1$\frac{1}{2}$–2$\frac{1}{2}$ in. long; leaflets distant, 17–25, alternate, $\frac{1}{4}$ in. long, grey-green, thinly coated with adpressed short white hairs; stipules minute, deltoid. *Racemes* 4–6-flowered; pedicels very short; bracts minute. *Calyx* $\frac{1}{8}$ in. campanulate, thinly white-silky; teeth linear or lanceolate, nearly as long as the tube. *Corolla* twice the calyx, white with a purple tip; standard longer than the wings and keel. *Pod* 1$\frac{1}{2}$ in. long, under $\frac{1}{24}$ in. thick, thinly white-canescent at first; dissepiment not at all incurved; seeds distant, very small.

14. **A. ophiocarpus,** *Benth. MSS.*; heads lax nearly sessile, leaflets oblong emarginate, pod very long and slender sickle-shaped slightly torulose unilocular 10–12-seeded. *Bunge Mon.* i. 10; ii. 6; *Boiss. Fl. Orient.* ii. 224.

LADAK, alt. 11,000 ft., *Thomson.*—DISTRIB. Persia.

Stems slender, diffuse, $\frac{1}{4}$–$\frac{1}{2}$ ft., densely finely white-downy. *Leaves* distinctly petioled, $\frac{1}{2}$–1 in. long; leaflets moderately close and thick, distinctly notched at the apex, matted on both sides with short white hairs; stipules lanceolate, very minute. *Racemes* 3-6–flowered; pedicels and bracts minute. *Calyx* under $\frac{1}{12}$ in., densely matted; teeth lanceolate, shorter than the tube. *Corolla* nearly twice the calyx, its petals subequal in length. *Pod* 1–1$\frac{1}{2}$ in. long, thick, finely downy, the dissepiment not at all incurved, the oblong seeds with a space corresponding to the slight constrictions of the pod between them.

15. **A. tribuloides,** *Delile*; *DC. Prodr.* ii. 288; heads dense sessile, leaflets 13–15 oblong-lanceolate acute, pod short linear-oblong densely pubescent little recurved 10-12-seeded subbilocular. *Bunge Mon.* i. 10; ii. 7; *Boiss. Fl. Orient.* ii. 224. A. minutus, erpocaulis and ammocryptos, *Boiss. Diagn.* ix. 58–9.

Plains of PUNJAB.—DISTRIB. Canaries, through Egypt to Afghanistan.

Stems slender, densely cæspitose, trailing, $\frac{1}{4}$–1 ft., densely clothed upwards with ascending white hairs. *Leaves* distinctly petioled, 1–2$\frac{1}{2}$ in. long; leaflets mostly close, densely clothed with long white hairs on both sides; stipules minute. *Heads* 6–10-flowered. *Calyx* tubular, $\frac{1}{8}$–$\frac{1}{6}$ in., densely matted; teeth setaceous, shorter than the tube. *Corolla* pale yellow, little exserted. *Pods* $\frac{3}{8}$ in. long, turgid, densely pubescent, the cluster often spreading from the stem like the spokes of a wheel from the axis.

16. **A. hamosus,** *Linn.*; *DC. Prodr.* ii. 290; heads peduncled dense, leaflets 13–25 oblong emarginate, pod long cylindrical glabrous much recurved nearly bilocular 16–18-seeded. *Sibth. & Sm. Fl. Græc.* t. 728; *Bunge Mon.* i. 13; ii. 13; *Boiss. Fl. Orient.* ii. 238.

Plains of PUNJAB at Lahore, Peshawur, &c.—DISTRIB. Canaries, Mediterranean region, Orient.

More robust and less hairy than the other species, the *stems* 1–2 ft. long. *Leaves* distinctly petioled, $\frac{1}{4}$–$\frac{1}{2}$ ft. long; leaflets distinctly stalked, pale green, $\frac{1}{2}$–$\frac{3}{4}$ in. long, glabrescent above, or thinly matted with silvery hairs on both sides. *Heads* 6–20-flowered; peduncles much shorter than the leaves. *Calyx* $\frac{1}{6}$ in., matted with mixed black and white hairs; teeth subulate, as long as the tube. *Corolla* pale yellow, half as long again as the calyx. *Pod* $\frac{1}{2}$–1 in. long, cylindrical, firmer than in its neighbours, quite glabrous.

17. **A. gracilipes,** *Benth. MSS.*; heads dense peduncled few-flowered, leaflets 9–13 oblong obtuse, pod cylindrical pubescent little recurved 10–12-seeded half-bilocular. *Bunge Mon.* i. 15; ii. 17.

WEST TIBET; Zanskar and Indus valley, alt. 11–14,000 feet, *Thomson.*

Acaulescent, or stems short, suberect, densely clothed with ascending strong white hairs. *Leaves* long-petioled, 1–3 inches long; leaflets distant, greenish, $\frac{1}{4}$–$\frac{3}{8}$ in. long, densely clothed with hairs like those of the stem; stipules minute. *Heads* 3–6-flowered; peduncles pilose, 2–4 in. *Calyx* $\frac{1}{6}$ in., tubular; teeth short, setaceous. *Corolla* pale yellow, twice the calyx; standard narrowed suddenly into a deltoid tip, the wings shorter and keel shorter still. *Pod* $\frac{1}{2}$–$\frac{5}{8}$ in. long by $\frac{1}{6}$ in., sessile, clothed with short dense white bristly hairs.

18. **A. contortuplicatus,** *Linn.*; *DC. Prodr.* ii. 290; heads dense short-peduncled, leaflets 13–17 oblanceolate-oblong emarginate, pod cylindrical downy very much recurved nearly bilocular 20–30-seeded. *Bunge Mon.* i. 18; ii. 20; *Boiss. Fl. Orient.* ii. 230.

Plains of PUNJAB and SCINDE.—DISTRIB. East Europe, Orient, West Siberia.

Stems suberect, ½–1½ ft., densely clothed with short soft spreading white hairs. *Leaves* distinctly petioled, 3–4 inches long; leaflets ¼–½ in., distant, greenish, thin at first, densely pilose on both sides; stipules lanceolate, free, larger than in all the preceding. *Heads* very dense, many-flowered, on pilose peduncles much shorter than the leaves. *Calyx* ⅙ in., densely pilose; teeth setaceous, plumose, exceeding the tube. *Corolla* little exserted, the lanceolate acute wings shorter than the standard and keel. *Pod* ½ in. long, sausage-shaped, membranous, rugose, completely conduplicate.

SUBGEN. 4. **Podolotus,** *Royle.* A caulescent perennial, with a few obscure basifixed hairs and naked stigma, differing from all the other groups by the endocarp of the unilocular pod separating as a thin membrane and produced into septa between the seeds.

19. **A. hosackioides,** *Benth. Gen.* i. p. 507. Podolotus hosackioides, *Royle Ill.* 198.

KUMAON and GURWHAL, temperate region.

Stems slender, glabrous, zigzag, densely cæspitose, 1¼–1½ ft. *Leaves* short-petioled, 1–1½ in.; leaflets 13–15, green, glabrous, oblong, obtuse, ⅛–⅜ in.; stipules minute, deltoid. *Peduncles* equalling or exceeding the leaves, 1–2-flowered. *Calyx* ⅛ in., glabrous; teeth short, deltoid. *Corolla* yellow, twice the calyx; petals equal in length, wings and keel abruptly incurved. *Pod* linear, turgid, straight, ½–¾ in. long, 5–6-seeded, with a stalk as long as the calyx.

SUBGEN. 5. **Hypoglottis.** Herbaceous perennials, with basifixed hairs, flowers in dense mostly peduncled capitate heads, and naked stigmas.

* *Heads sessile or peduncled. Flowers lilac or purple.*

20. **A. confertus,** *Benth. MSS.*; stems very dwarf densely cæspitose thinly clothed with adpressed white hairs, leaflets 11–13, calyx clothed with adpressed black hairs, teeth linear shorter than the tube, pod stalked unilocular, few-seeded. *Bunge Mon.* i. 23; ii. 27.

WEST TIBET, alpine region; Pangong and Parang valley, alt. 15–17,500 ft., *Thomson, Henderson.*

Rhizome woody, fusiform, the whole plant not more than 1–3 inches high above the soil. *Leaves* ¼–½ in. long; leaflets silvery, thick, close, complicate, oblong, densely canescent, 1/12 in. or less long; stipules small, lanceolate. *Heads* 6–8-flowered; peduncle 1–1½ in., mostly subradical, clothed with adpressed black and white silky hairs; pedicels and bracts very small. *Calyx* ⅙ in., the tube campanulate. *Corolla* twice the calyx; keel and wings subequal, rather shorter than the standard. *Ovary* silky, not seen fully developed.

21. **A. rigidulus,** *Benth. MSS.*; stems very short glabrous, leaflets 17–21, calyx clothed with adpressed black silky hairs, teeth lanceolate as long as the tube, pod oblong turgid sessile unilocular 6–8-seeded. *Bunge Mon.* i. 23; ii. 25.

SIKKIM, alpine region; Tungu, alt. 13,000 ft., *Hook. fil.*

Rhizome slender, much branched below the surface, the whole plant closely resembling *A. alpinus* in habit, not more than 3–4 inches high above the soil. *Leaves* distinctly petioled, 1–1½ in.; leaflets green, linear-oblong, obtuse, ⅙–¼ in. long, thinly coated with adpressed white hairs; stipules ⅙ in. deltoid, membranous. *Heads* 6–10-flowered; peduncles and pedicels both very short. *Calyx* under ¼ in. *Corolla* twice the calyx; limb of standard oblong, exceeding the wings and keel. *Pod* glabrous, oblong, membranous, ½ in. long.

22. **A. alpinus,** *Linn. Sp.* 1070?; stems short slender clothed with adpressed white silky hairs, leaflets 11–13, calyx clothed with adpressed mixed

black and white silky hairs, teeth setaceous as long as the tube, ovary stalked glabrous few-ovuled. Phaca astragalina, *DC. Prodr.* ii. 274?

WEST TIBET; Burgil pass, *Winterbottom*.—DISTRIB. Alpine region through north temperate zone.

Stems 3–4 in. high, simple, ascending. *Leaves* about an inch long; leaflets oblong, acute, pale green, thinly coated with close silvery hairs on both sides; stipules deltoid, foliaceous, rather large. *Peduncles* 1–1½ in., thinly silky. *Heads* 3–6-flowered; bracts linear, exceeding the short pedicels. *Calyx* ¼ in. *Corolla* twice the calyx; wings shorter than the standard and keel. *Pod* not seen.—The Sikkim plant referred here by Bunge is our *A. kongrensis*.

23. **A. tibetanus**, *Benth. MSS.*; stems slender short ascending thinly clothed with adpressed mixed black and white hairs, leaflets 21–25, calyx-teeth densely black-silky setaceous a third as long as the tube, pod linear stalked bilocular 6–10-seeded. *Bunge Mon.* i. 52; ii. 85; *Boiss. Fl. Orient.* ii. 250. A. Maxwellii, *Royle Ill.* 198?

West Tibet, temperate and alpine region, alt. 9–14,000 ft.; DRAS, ZANSKAR, NUBRA, LADAK, *Thomson*, *Henderson*.—DISTRIB. Afghanistan.

General habit of *A. Hypoglottis*, to which it is closely allied. *Stems* zigzag, firm, slender, branched, ¼–½ ft. *Leaves* 2–4 in. long, distinctly petioled; leaflets oblong, obtuse, moderately close, pale green, thinly canescent at first, glabrescent above when mature; stipules small, lanceolate or deltoid, free. *Heads* subglobose, 10–20-flowered; peduncles 1–4 in., the black hairs predominating upwards; bracts lanceolate, much exceeding the short black pedicels. *Calyx* ⅜ in., the teeth densely, the tube thinly black-silky. *Corolla* twice the calyx; wings shorter than the standard; keel still shorter. *Pod* ½–¾ in., rather recurved, finely black-silky; stalk shorter than the calyx-tube.

24. **A. hypoglottoides**, *Baker*; stems slender short ascending thinly clothed with adpressed white hairs, leaflets 17–19, calyx densely coated with mixed black and white silky hairs, teeth linear a third as long as the tube, ovary stalked 8–10-ovulate.

TIBETAN HIMALAYAS, the exact station not known, *Dr. Henderson*.

Closely allied to the last, with which it agrees in general habit. *Leaves* 1–1½ in. long; leaflets oblong, obtuse, pale grey green, persistently coated on both sides with adpressed silvery hairs; stipules foliaceous, connate in lower half. *Flowers* 12–20, in a dense head, not more than half the size of those of *A. Hypoglottis* and *tibetanus*; peduncles 1½–2 in. long, with a few black hairs mixed with the white ones upwards. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in. *Corolla* deep purple, ⅜ in., the proportion of the petals as in the last. Developed *pod* unknown.

25. **A. lessertioides**, *Benth. MSS.*; stems short firm erect glabrous, leaflets 9–11, calyx-teeth linear densely black-silky half as long as the nearly naked tube, pod stalked silky unilocular 3–4-seeded. *Bunge Mon.* i. 24; ii. 28.

SIKKIM, alpine region; Tungu, alt. 13,000 ft., *Hook. fil.*

Whole plant under a foot high. *Leaves* 1–2 in. long; leaflets green, oblong, obtuse, ¼–½ in. long, with a few black hairs; stipules foliaceous, lanceolate, ¼–½ in. long, ciliated at first with black hairs; petiole twice as long as the stipules. *Heads* 12–20-flowered. *Pedicels* very short; peduncles erect ¼–½ ft., with a few adpressed black hairs in the upper half; bracts minute, shaggy with black hairs. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., tube campanulate, nearly naked; teeth black-plumose. *Corolla* ½ in., petals subequal. *Pod* ½ in. densely silky, narrowed from the middle to both ends; stalk as ong as the calyx-tube.

26. **A. strictus**, *Grah. in Wall. Cat.* 5924; stems short slender ascending

clothed with adpressed white silky hairs, leaflets 19–25, calyx clothed with adpressed mixed black and white hairs, teeth linear shorter than the tube, pod stalked linear-oblong unilocular 6–8-seeded. *Benth. in Royle Ill.* 198; *Bunge Mon.* i. 23; ii. 27. A. mutabilis, *Jacquem. MSS.*

Through the Himalayas in the alpine region, alt. 11–16,000 ft., from NUBRA and LADAK to SIKKIM and SILHET.

Stems densely cæspitose, firm but slender, branched, 1/4–1 ft. long. *Leaves* short-petioled, 1–1½ in. long; leaflets close, oblong, obtuse, 1/4–3/8 in. long, pale green, persistently coated with adpressed white hairs; stipules small, deltoid, free, foliaceous. *Heads* very dense, 20–40-flowered; peduncles 2–4 in., with a few black hairs mixed with the silvery ones near the top; pedicels black, shorter than the minute bracts. *Calyx* 1/8 in. *Corolla* twice the calyx; wings and keel shorter than the standard. *Pod* 1/4 in. long, short-stalked, rather recurved, clothed like the calyx.

27. **A. oxyodon,** *Baker*; stems short slender ascending clothed with adpressed white silky hairs, leaflets 15–17, calyx clothed with adpressed mixed black and white hairs, teeth setaceous twice as long as the tube, ovary stalked 5–6-ovulate.

WEST TIBET, *Falconer.*

General habit of *A. strictus*. *Stems* densely cæspitose, 1/4–1/2 foot high. *Leaves* 1–1½ in. long; leaflets oblong, obtuse or subacute, densely white-strigillose on the back, thinly on the face, alternate, the lower distant; stipules moderately large, connate, silky on the back. *Peduncles* 2–3 in., very slender, densely clothed with adpressed mixed black and white hairs; pedicels black, very short; bracts 1/12–1/8 in., lanceolate, membranous. *Calyx* 1/3 in.; tube campanulate; teeth much longer in proportion than in any of its allies. *Corolla* 1/2 in.; keel and standard equal; wings much shorter. Mature *pod* not seen; ovary thinly silky.

28. **A. densiflorus,** *Kar. & Kir. Enum. Pl. Song. No.* 245; stems elongated firm glabrous, leaflets 11–13, calyx minute clothed with mixed black and white hairs, teeth lanceolate short, pod globose sessile minute unilocular 1–2-seeded. *Bunge Mon.* i. 21; ii. 22.

West Himalayas, alpine region, alt. 12–17,000 ft.; LAHUL, SASSAR, ZANSKAR, LADAK, KUNAWAR.—DISTRIB. Afghanistan, Central Siberia.

Stems densely cæspitose, rigid, erect, 1/4–1 ft. long. *Leaves* 1–2 in. long; leaflets thick, oblong, glaucous, obtuse, 1/4–1/2 in. long, obscurely white-strigillose on both sides; stipules small, deltoid, foliaceous, free. *Peduncles* 1–4 in., with a few black and white hairs in the upper half; bracts minute, linear, black, ciliated, exceeding the very short black pedicels. *Calyx* 1/12–1/8 in., campanulate; teeth shorter than the tube. *Corolla* lilac, three times as long as the calyx; keel and wings much shorter than the standard. *Pod* rugose, silky, 1/8 in. long, turgid, membranous.

29. **A. melanostachys,** *Benth. MSS.*; stems elongated firm glabrous, leaflets 13–15, calyx clothed with black silky hairs, teeth as long as the tube, pod oblong sessile half-bilocular 2-seeded. *Bunge Mon.* i. 21; ii. 22. A. bracteosus, *Klotzsch Reise Pr. Wald. Bot.* 160, t. 5, *non Boiss.*

West Himalayas, alpine region, alt. 10–15,000 ft.; KASHMIR, LAHUL, TIBET.

Stems 1½–2 ft. high, moderately stout. *Leaves* distinctly petioled, 1–3 in. long; leaflets oblong, glaucous-green, obtuse or emarginate, 1/2–3/4 in. long, nearly naked; stipules 1/4–3/8 in., free, foliaceous, deltoid-cuspidate. *Heads* dense, 1–3 in. long; peduncles 2–6 in. long, clothed with short spreading mixed black and white hairs, dense at the base of the head; bracts 1/8–3/8 in., lanceolate, foliaceous, persistent. *Calyx* 1/6–1/5 in. nearly sessile. *Corolla* narrow, half as long again as the calyx; keel and wings shorter than the standard. *Pod* included in the calyx, 1/8 in. long, clothed with fine black silky hairs.

25434

30. **A. bhotanensis,** *Baker*; stems firm elongated glabrous, leaflets 21–25, calyx glabrous, teeth short linear, pod cylindrical sessile many-seeded half-bilocular.

BHOTAN, temperate region; grassy banks at Panga, 7000 ft., *Griffith.*

Stems 1–2 feet high, slender glabrous, terete, with distant nodes and ascending branches. *Leaves* 2–4 in. long; leaflets oblanceolate-oblong, obtuse, $\frac{1}{4}$–$\frac{3}{8}$ in. long, green and glabrescent above, clothed with a few obscure adpressed hairs below; stipules free, lanceolate, $\frac{3}{8}$–$\frac{1}{2}$ in. *Flowers* 12–20, in very dense heads; peduncles 2–5 in. long, with only a few obscure adpressed white hairs at the top; bracts lanceolate, glabrous, $\frac{1}{4}$–$\frac{1}{3}$ in. *Calyx* nearly sessile, $\frac{1}{4}$ in. long, tubular; teeth a third as long as the tube. *Corolla* twice the calyx, colour uncertain; wings rather shorter than the keel and the latter than the standard. *Pod* firm, turgid, straight, $\frac{1}{2}$–$\frac{3}{4}$ in. long; seeds about 20.

31. **A. inconspicuus,** *Baker*; stems short filiform trailing subglabrous, leaflets 15–17, calyx-tube with a few adpressed black hairs, teeth minute lanceolate or setaceous, pod stalked unilocular 10–12-seeded.

KUMAON; banks of the Ralam river, alt. 9000 ft., *Strachey and Winterbottom.*

Habit of a small *Vicia*. *Leaves* 1–1$\frac{1}{2}$ in. long; leaflets opposite, oblong, obtuse, $\frac{1}{4}$ in. long, green, glabrescent when mature, thinly silky at first; stipules minute, lanceolate. *Flowers* 3–4 together, on a short peduncle clothed with ascending grey silky hairs; pedicels distinct, but shorter than the minute deltoid bracts. *Calyx* $\frac{1}{8}$ in., tubuloso-campanulate, nearly naked. *Corolla* scarcely twice the calyx, the petals equal in length. *Pod* not seen mature.

32. **A. tenuicaulis,** *Benth. MSS.*; stems elongated subglabrous very weak and slender, leaflets 13–15, calyx thinly clothed with short black hairs, teeth not more than $\frac{1}{3}$–$\frac{1}{4}$ as long as the tube, pod oblong sessile unilocular 4–6-seeded. *Bunge Mon.* i. 23; ii. 28.

SIKKIM and EAST NIPAL, temperate region, alt. 7–9000 ft., *Hook. fil.*

Stems straggling, branched, a foot or more long. *Leaves* 1–1$\frac{1}{2}$ in.; leaflets oblong, obtuse, opposite, thin, glaucous green, finely downy; stipules free, minute. *Heads* 4–8-flowered, not very dense; peduncles an inch or less long, finely downy; bracts lanceolate or deltoid, minute. *Calyx* $\frac{1}{6}$ in., tubuloso-campanulate. *Corolla* $\frac{1}{3}$ in.; standard slightly exceeding the keel and wings. *Pod* $\frac{1}{4}$ in. turgid, membranous, obscurely downy.—General habit of an *Ervum.*

33. **A. sikkimensis,** *Benth. MSS.*; stems elongated slender weak nearly glabrous, leaflets 19–21, calyx clothed with adpressed black hairs, teeth half as long as the tube, pod small oblong stalked unilocular 2–3-seeded. *Bunge Mon.* i. 23; ii. 28.

SIKKIM and EAST NIPAL, alt. 8–12,000 ft., *Hook. fil.*

Stems 1–2 feet, erect, very slender, with distant nodes clothed only with a little minute adpressed white pubescence. *Leaves* 1$\frac{1}{2}$–2 in. long; leaflets oblong, obtuse or emarginate, clothed when young with adpressed white silky hairs, green and glabrescent above when mature; stipules minute, lanceolate, falcate. *Peduncles* short, clothed with copious adpressed black hairs; flowers 20–30 in an oblong head; pedicels black, very short; bracts deltoid, minute. *Calyx* $\frac{1}{6}$ in. tubuloso-campanulate. *Corolla* twice the calyx; standard slightly exceeding the keel and wings. *Pod* $\frac{1}{4}$–$\frac{1}{3}$ in. long, membranous, turgid, densely black-silky; stalk as long as the calyx-tube.

34. **A. himalayanus,** *Klotzsch Reise Pr. Wald. Bot.* 160, t. 4; stems elongated slender weak nearly glabrous, leaflets 21–25, calyx clothed with minute adpressed black and white hairs, teeth half as long as the tube, pod linear-oblong stalked subunilocular 5–6-seeded. A. carinalis, *Benth. MSS.*; *Bunge Mon.* i. 23; ii. 28. Phaca longicaulis and cachemerica, *Benth. MSS.*

WEST HIMALAYAS, temperate and alpine region, alt. 5–13,000 ft.; LAHUL, KULU, KUNAWAR, KASHMIR, GARWHAL.

Stems very slender, 1–2 feet long, with distant internodes, clothed when young with a few minute adpressed white hairs. *Leaves* $1\frac{1}{2}$–2 in. long; leaflets thin, oblong, obtuse or emarginate, $\frac{1}{4}$–$\frac{1}{2}$ in. long, pale green, with a few short adpressed white hairs; stipules minute, lanceolate, spreading. *Peduncles* shorter than the leaves, clothed with mixed black and white hairs; pedicels $\frac{1}{24}$ in.; bracts very minute. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in., campanulate. *Corolla* $\frac{1}{2}$–$\frac{5}{8}$ in., keel slightly exceeding the wings, falling short of the standard. *Pod* $\frac{3}{8}$–$\frac{1}{2}$ in. long, membranous, finely black-silky; stalk exceeding the calyx.—A specimen gathered by Strachey and Winterbottom at the Melam glacier in Kumaon has setaceous calyx-teeth, twice as long as the campanulate tube, and will probably prove a new species between *A. himalayanus* and *Maddenianus.*

35. **A. Maddenianus,** *Benth. MSS.*; stems elongated slender weak clothed at first with short spreading black and white hairs, leaflets 19–21, calyx clothed with minute adpressed black and white hairs, teeth setaceous as long as the tube, pod stalked unilocular 3–4-seeded.

KUMAON; temperate region, alt. 10–11,000 ft., *Madden, Edgeworth.*

General habit exactly as in *A. himalayanus*, but the young branches densely beset with short spreading black and white bristly hairs. *Leaves* $1\frac{1}{2}$–2 in. long; leaflets oblanceolate-oblong, obtuse, densely clothed at first on both sides with adpressed silvery hairs; stipules minute, spreading. *Heads* few-flowered; peduncle $\frac{1}{2}$–1 in., clothed like the branches; bracts linear, exceeding the short black pedicels. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in. *Corolla* $\frac{1}{2}$ in.; wings much shorter than standard and keel. *Pod* $\frac{3}{8}$ in. long, membranous, densely white-silky, narrowed to both ends; stalk exceeding the calyx.

** *Heads peduncled. Flowers yellow.*

36. **A. cashmirensis,** *Bunge Mon.* i. 30; ii. 34; stems elongated shaggy with long hairs, leaflets 29–33, calyx thinly clothed with long hairs, corolla much exserted, pod sessile finely pubescent bilocular 6–8-seeded.

KASHMIR, temperate region, alt. 9–10,000 ft., *Jacquemont, Falconer.*

Stems stout, erect or ascending, under a foot high. *Leaves* distinctly petioled, 3–4 inches long; leaflets close, oblong, obtuse or acute, $\frac{3}{8}$–$\frac{1}{2}$ in. long, dull green, clothed densely at first with long fine hairs; stipules $\frac{1}{2}$ in. long, free, lanceolate, membranous, striated. *Heads* dense, round; peduncle 1–3 in.; pedicel $\frac{1}{12}$–$\frac{1}{8}$ in., shaggy; bracts linear, plumose, persistent, $\frac{1}{4}$–$\frac{3}{8}$ in. long. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in.; teeth linear, shorter than the tube. *Corolla* $\frac{3}{4}$ in.; standard exceeding the wings and keel. *Pod* $\frac{1}{2}$ in. long, firm in texture, linear-oblong, straight, hollowed down the keel, narrowed into a long beak.

VAR. 1. *Falconeri*, Baker; taller, much less shaggy, stipules narrower an inch long, leaflets 31–34 broad-oblong obtuse.—Kashmir, *Falconer.*

37. **A. floridus,** *Benth. MSS.*; stems elongated clothed with minute rather spreading black hairs, leaflets 25–31, calyx densely clothed with adpressed black hairs, pod long-stalked unilocular 4–5-seeded. *Bunge Mon.* i. 24; ii. 28.

SIKKIM, alpine region; Tungu, alt. 13,000 ft., *Hook. fil.*

Stems moderately stout, erect, $\frac{1}{2}$–1 ft. *Leaves* $1\frac{1}{2}$–3 in.; leaflets linear-oblong, glaucous, subacute, $\frac{3}{8}$–$\frac{1}{2}$ in., thinly clothed with adpressed silvery bristles; stipules lanceolate or deltoid, free, $\frac{1}{8}$–$\frac{1}{4}$ in. *Heads* round or oblong, 12–30-flowered, the lower flowers cernuous; peduncle 1–2 in., densely black-silky; pedicels black, $\frac{1}{12}$ in.; bracts linear, minute. *Calyx* under $\frac{1}{4}$ in.; teeth short, linear. *Corolla* bright yellow, twice the calyx; petals nearly equal. *Pod* linear-oblong, $\frac{1}{2}$ in. long, narrowed to both ends, densely black-silky; stalk as long as the calyx-tube.

38. **A. leucocephalus,** *Grah. in Wall. Cat.* 5923; stems short slender densely clothed with loose white hairs, leaflets 21–31, calyx shaggy with white hairs, corolla little exserted, pod minute oblong sessile unilocular 3–4-seeded. *Benth. in Royle Ill.* 198, t. 32, fig. 2; *Bunge Mon.* i. 48; ii. 76; *Boiss. Fl. Orient.* ii. 241.

West Himalayas, temperate and tropical zone, alt. 1–7,000 ft.; PUNJAB, KASHMIR, SIMLA, GURWHAL, KUMAON.—DISTRIB. Afghanistan.

Stems densely cæspitose, ascending, $\frac{1}{4}$–$\frac{1}{2}$ ft., densely persistently tomentose. *Leaves* 1–3 in. long; leaflets close, oblong, glaucous, densely argenteo-canescent, thick, obtuse or subacute, $\frac{1}{8}$–$\frac{1}{4}$ in. long; stipules small, foliaceous, connate below the middle. *Heads* small, very dense, oblong; peduncles 2–6 in., densely white-tomentose; bracts lanceolate, exceeding the buds. *Calyx* $\frac{1}{6}$ in. long, subsessile, very shaggy; teeth setaceous, as long as the tube. *Corolla* pale yellow, $\frac{1}{4}$ in.; keel rather shorter than the standard and wings. *Pod* $\frac{1}{8}$ in. long, included in the calyx, finely downy.

*** *Heads few-flowered, sessile or nearly so, in the axils of the leaves of an elongated stem; flowers yellow.*

39. **A. Munroi,** *Benth. MSS.*; *Bunge Mon.* i. 30; ii. 35.

Tibet Himalayas, alpine region; PITI, LAHUL, LADAK.—DISTRIB. Kashgar, *Bellew.*

Rhizome stout, long, woody, fusiform. *Stems* cæspitose, stout, erect, $\frac{1}{2}$–1 ft., shaggy throughout with dense spreading white hairs. *Leaves* 1$\frac{1}{2}$–2 in. long; leaflets 19–21-oblanceolate, obtuse, $\frac{3}{4}$–1 in. long, thinly clothed with loose white hairs; stipules $\frac{1}{4}$ in., free, linear, or lanceolate. *Calyx* short-pedicelled, $\frac{1}{2}$–$\frac{5}{8}$ in., thinly pubescent; teeth linear-setaceous, nearly as long as the tube. *Corolla* $\frac{3}{4}$–$\frac{7}{8}$ in., pale yellow; petals subequal. *Pod* oblong, sessile, membranous, much inflated, an inch long, nearly bilocular, 10–12-seeded.

SUBGEN. 6. **Phaca.*** Herbaceous perennials or undershrubs with flowers in elongated racemes, basi-fixed hairs and naked stigmas.

* *Stipules small.*

40. **A. macropterus,** *DC. Prodr.* ii. 283; shrubby, leaflets 13–17 oblanceolate, calyx-teeth minute, corolla lilac, pod oblong sessile turgid bilocular 5–6-seeded. *Bunge Mon.* i. 21; ii. 22. A. vicioides, *Led. Fl. Alt.* 3, 301, t. 286. A. distans, *Benth. MSS.* A. longipes, *Kar. and Kir.*; *Led. Fl. Ross.* i. 618. A. puberulus, *K. and K. Enum. Pl. Alt. No.* 240.

Tibetan Himalayas, alpine region, alt. 9–12,000 ft.; LADAK, ZANSKAR, &c., *Thomson.*—DISTRIB. Western and Central Siberia.

An erect undershrub, 2–3 ft. high, with numerous erecto-patent stiff virgate glabrous branches. *Leaves* 2–3 in. long; leaflets distant, thick, pale green, glabrescent, $\frac{1}{2}$–$\frac{3}{4}$ in. long; stipules minute, lanceolate, free, spreading, caducous. *Racemes* very lax, $\frac{1}{2}$–1 ft. long; peduncles stiff, ascending, $\frac{1}{2}$–1 ft.; pedicels $\frac{1}{12}$ in.; bracts very minute. *Calyx* campanulate, $\frac{1}{12}$ in. long, with a few minute adpressed black hairs; teeth deltoid-cuspidate. *Corolla* $\frac{3}{8}$ in.; keel much shorter than the wings and standard. *Pod* $\frac{1}{4}$–$\frac{1}{3}$ in. long, glabrous, turgid, narrowed to a beak, nearly straight.

41. **A. chlorostachys,** *Lindl. in Trans. Hort. Soc.* vii. 249; shrubby, leaflets 13–17 oblong, calyx-teeth very short, bracts lanceolate, corolla pale green tinged with lilac, pod oblong turgid stalked bilocular 6–10-seeded. *Bunge Mon.* i. 27; ii. 32. A. Govanianus, *Grah. in Wall. Cat.* 5925. A. himalensis, *Jacquem. MSS.*

West Himalayas, alpine and temperate region, alt. 5–14,000 ft.; PANGI, LAHUL, KASHMIR, SIMLA, KUMAON, GURWHAL.

---

* Name used here in a much more restricted sense than in Bunge's Monograph.

An undershrub, several feet high, with abundant slender branches, pubescent when mature, clothed with short spreading hairs above. *Leaves* ¼–½ ft. long; leaflets thin, oblong, obtuse, ½–¾ in. long, green, glabrescent above, glaucous, finely white-silky beneath; stipules lanceolate, free, small, spreading. *Racemes* close, copious, long-peduncled, 2–4 in. long; pedicels $\frac{1}{12}$ in. long; bracts lanceolate, scarcely exceeding the buds. *Calyx* tubular, under ¼ in. long, finely downy, oblique at the mouth, the teeth deltoid. *Corolla* twice the calyx; petals subequal. *Pod* turgid, membranous, glabrous, ½ in. long, narrowed to both ends; its stalk twice the calyx.

42. **A. Stewartii,** *Baker*; shrubby, leaflets 13–15 oblong, calyx-teeth half as long as the tube, bracts long setaceous plumose, corolla pale yellow tinged with lilac, pod oblong turgid stalked bilocular 6–8-seeded.

HAZARA, temperate region, alt. 5–9000 ft., *Dr. J. L. Stewart.*

Habit of the last, from which it differs by its leaves persistently and densely white-silky, and long setaceous plumose calyx-teeth and bracts, the latter conspicuously protruded beyond the buds. *Stipules* ¼ in., linear-setaceous, spreading, caducous. *Branches* firm, many-ribbed, clothed with copious adpressed short white hairs. *Racemes* ¼–½ ft., in the single specimen panicled near the base. *Calyx* ¼ in. long, including the teeth, densely silky. *Pod* ¼–⅓ in. long, oblong, glabrous, very turgid, fully bilocular.

43. **A. longicaulis,** *Baker*; shrubby, leaflets 21–25, narrow-oblong, calyx-teeth half as long as the tube, bracts long setaceous plumose, corolla pale yellow-lilac, pod oblong turgid stalked bilocular 10–12-seeded.

KASHMIR, temperate region, *Falconer.*

General habit of the two preceding, to which it is closely allied. *Branches* with only a few adpressed short silky hairs. *Leaves* 4–6 in. long; leaflets ½–¾ in. long, finely white-silky, greenish above, glaucous beneath; stipules minute, free, lanceolate. *Bracts* as in the last. *Calyx* ¼ in., with copious minute adpressed black hairs and deciduous longer white ones. *Pod* ½–⅝ in. long, glabrous, narrowed to both ends; its stalk ¼–⅓ in. long.

44. **A. ciliolatus,** *Benth. MSS.*; stems herbaceous, leaflets oblong 17–19, calyx-teeth elongated setaceous, corolla yellow tinged with lilac, pod oblong turgid stalked bilocular 8–10-seeded. *Bunge Mon.* i. 27; ii. 33.

West Himalayas, temperate region; LADAK, KASHMIR, KISTWAR, alt. 6–9000 ft.; *Thomson, Falconer.*

Stems 1–2 ft. or more high, firm, hollow, erect, glabrous. *Leaves* reaching ½–¾ ft. long; leaflets thin, obtuse, green and glabrescent, ½–1½ in. long, glaucous, thinly white-silky at first below; stipules ¼–½ in., free, persistent, lanceolate or deltoid. *Racemes* long-peduncled close, subsecund; bracts linear, not exceeding the buds. *Calyx* ⅜ in., oblique, tubular; teeth setacecus, plumose, half as long as the tube. *Corolla* nearly twice the calyx; keel shorter than the other petals, broad, abruptly upcurved. *Pod* 1 in. long, oblong, turgid, membranous narrowed into a beak, clothed with fine short spreading black hairs; stalk as long as the calyx.

45. **A. xiphocarpus,** *Benth. MSS.*; herbaceous, leaflets 21–25 oblong, corolla yellow, calyx-teeth short linear, pod ensiform subcompressed stalked bilocular 8–12-seeded. *Bunge Mon.* i. 27; ii. 32.

East Himalayas, alpine region, alt. 10–11,000 ft.; SIKKIM and East NIPAL, *Hook. fil.*

Stems 2–3 ft. high, erect, hollow, obscurely pubescent upwards, glabrous below. *Leaves* ¼–½ ft. long; leaflets thin, narrow, oblong, obtuse, 1–1½ in. long, green, glabrescent above, glaucous, thinly silky below; stipules lanceolate, spreading, free, ¼–1 in.

Racemes long-peduncled, at first close, finally 2–3 in. long; pedicels $\frac{1}{12}$–$\frac{1}{8}$ in., black; bracts lanceolate, not protruded. *Calyx* $\frac{3}{8}$ in., tubular, with a few black hairs; teeth more densely black-silky, less than half as long as the tube. *Corolla* bright yellow, $\frac{1}{2}$–$\frac{5}{8}$ in.; petals subequal. *Pod* 1–1$\frac{1}{2}$ in. by $\frac{1}{6}$–$\frac{1}{5}$ in., glabrous, membranous, narrowed gradually to both ends, rather recurved; stalk as long as the calyx.

46. **A. emodi,** *Steud. Nomen. edit.* 2, p. 161; herbaceous, leaflets oblong 21–25, calyx-teeth half as long as the tube, corolla yellow, pod long-stalked oblong turgid subbilocular 12-16-seeded. *Bunge Mon.* i. 28; ii. 33. A. podocarpus, *Grah. in Wall. Cat.* 5930, *non C. A. Meyer.*

KUMAON, alt. 10–11,000 ft., *Blinkworth, Strachey and Winterbottom.*

Stems tall, fistular, stout, erect, glabrous. *Leaves* 6–9 in. long; leaflets thin, obtuse, $\frac{3}{4}$–1 in. long, glabrescent on both sides, green above, glaucous beneath; stipules lanceolate, acute, free, reflexed. *Racemes* long-peduncled, 2–3 in. long; pedicels ascending, $\frac{1}{8}$ in. long, finely downy; bracts lanceolate, $\frac{1}{4}$–$\frac{3}{8}$ in. *Calyx* $\frac{1}{4}$ in., long, subglabrous, tubular. *Corolla* twice the calyx; petals equal. *Pod* oblong, turgid, membranous, glabrous, 1$\frac{1}{4}$–1$\frac{1}{2}$ in. long, narrowed gradually into a beak; stalk $\frac{1}{2}$–$\frac{3}{4}$ in. long.

47. **A. khasianus,** *Benth. MSS.*; shrubby, leaflets oblong 21–25, calyx-teeth minute, corolla yellow, pod oblong turgid stalked bilocular 12-16-seeded. *Bunge Mon.* i. 27; ii. 32.

KHASIA, temperate region, alt. 6–7000 ft., *Hook. fil. and Thomson, Griffith.*

Stems tall, erect, shrubby, much branched, subglabrous. *Leaves* 4 in. long; leaflets thin, narrow oblong, obtuse, $\frac{1}{2}$–$\frac{3}{4}$ in. long, green and glabrescent above, glaucous with a few adpressed white hairs below; stipules lanceolate, free, $\frac{1}{2}$ in. long. *Racemes* long-peduncled, moderately close, subsecund, finally 3–4 in. long; pedicels $\frac{1}{8}$ in., finely downy; bracts lanceolate, caducous, $\frac{1}{4}$ in. *Calyx* $\frac{1}{4}$ in., tubular, scarcely at all pilose. *Corolla* twice the calyx; petals subequal. *Pod* oblique oblong, very turgid, membranous, glabrous; stalk exceeding the calyx.

48. **A. coluteocarpus,** *Boiss. Diagn.* ix. 65; shrubby, leaflets round-oblong 11–13, calyx-teeth long, corolla yellow, pod oblong turgid stalked bilocular 10–12-seeded. *Bunge Mon.* i. 26; ii. 32; *Boiss. Fl. Orient.* ii. 271.

WEST TIBETAN HIMALAYAS and KUNAWAR, alt. 6–10,000 ft., *Thomson, Munro.*—DISTRIB. Afghanistan.

A tall undershrub, with copious erecto-patent terete virgate glabrous branches. *Leaves* 4–5 in. long; leaflets opposite, firm, glabrous, obtuse, glaucous, $\frac{1}{4}$–$\frac{3}{4}$ in. long; stipules free, minute, deltoid. *Racemes* long-peduncled, at first close, finally $\frac{1}{4}$–$\frac{1}{2}$ ft. long; pedicels short, pilose; bracts linear, not protruded. *Calyx* $\frac{3}{8}$ in., tubular, thinly pilose; teeth setaceous, half as long as the tube. *Corolla* $\frac{5}{8}$ in.; keel abruptly incurved, much shorter than the wings and standard. *Pod* glabrous, very turgid, 1–1$\frac{1}{4}$ in. long, narrowed to both ends; stalk finally longer than the calyx.

** *Stipules large.*

49. **A. frigidus,** *Bunge Mon.* i. 25; ii. 28; herbaceous, leaflets 9–15 oblong, calyx-teeth minute, pod oblong stalked unilocular 6–8-seeded. Phaca frigida, *Linn.*; *DC. Prodr.* ii. 273.

WESTERN HIMALAYAS, temperate region; GURWHAL, KISTWAR, LAHUL.—DISTRIB. Mountains through the north temperate zone.

Stems 1–2 ft. high, erect, stout, glabrous. *Leaves* 4–6 in. long; leaflets opposite, thin, an inch or more long, green, glabrescent above, glaucous with a few obscure hairs below; stipules ovate or lanceolate, acute or obtuse, free, persistent, $\frac{1}{2}$–$\frac{3}{4}$ in. long. *Racemes* long-peduncled, moderately close, subsecund, finally 2–3 in. long; pedicels black-

silky, $\frac{1}{12}$–$\frac{1}{8}$ in. *Calyx* $\frac{3}{8}$ in., tubular, with a few obscure adpressed black hairs. *Corolla* twice the calyx, bright yellow; standard exceeding the wings and keel. *Pod* an inch long, glabrous, turgid, membranous, narrowed to both ends.

50. **A. vicioides,** *Grah. in Wall. Cat.* 5931, *non. Ledeb.* Herbaceous, leaflets oblong 17–21, calyx-teeth minute, pod oblong stalked bilocular 8–9-seeded. A. concretus, *Benth. in Royle Ill.* 199.

Central Himalayas, temperate region; NIPAL, KISTVAR and KUNAWAR.

Stems 1–2 ft. high, erect, moderately stout, hollow, glabrous. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ ft.; leaflets 1–1$\frac{1}{2}$ in. long, thin, oblong, obtuse, green and glabrescent above, glaucous, with a few adpressed hairs below; stipules broad, membranous, connate, $\frac{1}{2}$–$\frac{3}{4}$ in. long. *Racemes* long-peduncled, close, 2–3 in. long; pedicels $\frac{1}{12}$–$\frac{1}{8}$ in., subglabrous; bracts lanceolate, $\frac{1}{4}$ in. *Calyx* $\frac{1}{4}$ in., tubular, glabrous except the teeth, the mouth oblique. *Corolla* bright yellow, twice the calyx; petals equal. *Pod* glabrous, oblong, membranous, turgid, $\frac{1}{2}$–$\frac{3}{4}$ in. long, narrowed to both ends.

51. **A. graveolens,** *Ham. in Wall. Cat.* 5929; shrubby, leaflets 17–19 round-oblong, calyx-teeth half as long as the tube, pod ensiform subcompressed stalked bilocular 12–18-seeded. *Bunge Mon.* i. 26; ii. 31; *Benth. in Royle Ill.* 199. A. rotundifolius, *Royle Ill.* 199; *Bunge loc. cit.* A. medullaris, *Boiss. Diagn.* ix. 66; *Fl. Orient.* ii. 268; *Bunge loc. cit.* A. Scottianus, *Stocks MSS.* A. stipulatus, *Jaquem. MSS. non Don.*

West Himalayas, temperate region, alt. 4–12,500 ft.; KASHMIR, KISTVAR, PITI, GURWHAL, KUNAWAR, KUMAON.—DISTRIB. Afghanistan, Beloochistan.

A tall undershrub, with copious virgate terete glaucous branches. *Leaves* 4–6 in. long; leaflets opposite, firm, obtuse, glaucous, glabrous on both sides, subdistant, $\frac{1}{2}$–1 in. long; stipules free, foliaceous, cordate, ovate or lanceolate, 1–1$\frac{1}{2}$ in. long. *Racemes* long-peduncled, $\frac{1}{2}$–1 ft. long; pedicels, $\frac{1}{12}$–$\frac{1}{8}$ in.; bracts linear, glabrous. *Calyx* tubular, glabrous, $\frac{3}{8}$ in. long; mouth very oblique. *Corolla* yellow, twice the calyx; standard slightly exceeding the wings and keel. *Pod* 1–1$\frac{1}{4}$ in. long, $\frac{1}{4}$ in. broad, glabrous, membranous, nearly straight; stalk as long as the calyx.

52. **A. stipulatus,** *D. Don in Bot. Mag.* t. 2380; *Prod. Nep.* 246; herbaceous, leaflets 31–41 oblong, calyx-teeth as long as the tube, pod oblong subsessile bilocular 15–20-seeded. *Wall. Cat.* 5928; *Benth. in Royle Ill.* 199; *Bunge Mon.* i. 28; ii. 33.

East Himalayas, temperate region, alt. 6–8000 ft; NIPAL and SIKKIM.

Stems stout, erect, hollow, glabrous, 3–6 ft. high. *Leaves* $\frac{1}{2}$–1 ft. long; leaflets thin, obtuse, 1–2 in. long, green, glabrescent above, glaucous with a few adpressed hairs below; stipules membranous, concrete, leaf-opposed, amplexicaul, 1–3 in. long. *Racemes* long-peduncled, $\frac{1}{2}$–1 ft. long, at first dense; pedicels $\frac{1}{8}$ in.; bracts $\frac{1}{2}$ in., lanceolate, membranous. *Calyx* tubular, $\frac{3}{8}$–1$\frac{1}{2}$ in., finely grey-downy. *Corolla* yellow, $\frac{3}{4}$ in.; petals equal. *Pod* glabrous, turgid, rather recurved, narrowed into a long beak.

SUBGEN. 7. **Myobroma,** *Bunge.* Stemless or short-stemmed perennial or low shrubs, with stipules adnate in the lower part to the petiole, leaf-rachis ending in a leaflet, large yellow flowers in close heads, gibbous calyces and naked stigmas.

* *Stemless.*

53. **A. rhizanthus,** *Royle Ill.* 200; heads subsessile, leaflets oblong obtuse densely silky, leaf-rachis not indurated, calyx-teeth linear, pod subsessile. *Bunge Mon.* i. 35; ii. 60.

West Himalayas, temperate and alpine regions, alt. 9–16,000 ft.; ZANSKAR, LAHUL, KASHMIR, KUNAWAR.

Tufts one or several together at the crown of a woody rootstock. *Stipules* $\frac{3}{8}$–$\frac{1}{2}$ in., lanceolate; petiole and leaf-rachis densely silky, the latter 2–4 in. long, not persisting after the leaflets fall; leaflets 31–41, $\frac{1}{4}$–$\frac{1}{2}$ in. long, glaucous, persistently silky on both sides, the upper close, the lower distant. *Heads* dense, many-flowered, usually quite sessile at the crown of the rootstock; bracts linear, $\frac{1}{4}$–$\frac{1}{2}$ in. long, densely silky. *Calyx* tubular, silky, $\frac{1}{2}$–$\frac{5}{8}$ in. long; teeth half as long as the tube. *Corolla* half as long again as the calyx; wings shorter than the standard, and keel than the wings. *Pod* densely silky, $\frac{1}{2}$–$\frac{3}{4}$ in. long, oblong, turgid, bilocular, splitting open the calyx, 15–20-seeded, narrowed suddenly into the beak.

54. **A. acaulis,** *Baker MSS.*; heads subsessile, leaflets lanceolate acute glabrous, leaf-rachis not indurated, calyx-teeth lanceolate, ovary stipitate.

SIKKIM, alpine region, alt. 16–17,000 ft., *Hook. fil.*

Tufts several from the crown of the woody rootstock, the glabrous stems at most an inch long. *Leaves* 2–3 in. long, distinctly petioled; leaflets 25–31, green, narrowed gradually to a point, $\frac{1}{4}$–$\frac{1}{3}$ in. long; stipules $\frac{1}{4}$ in., membranous, lanceolate. *Heads* 2–3-flowered, sessile. *Calyx* under $\frac{1}{2}$ in. long, clothed with a few adpressed hairs; teeth a third as long as the tube. *Corolla* bright yellow, twice the calyx; petals subequal; standard $\frac{1}{2}$ in. broad, *Ovary* glabrous, distinctly stalked; ovules 12–16. *Pod* not seen.

55. **A. Webbianus,** *Grah. in Wall. Cat.* 5936; heads subsessile, leaflets oblong obtuse glabrous, leaf-rachis indurated, calyx-teeth linear-setaceous, pod subsessile. *Benth. in Royle Ill.* 199; *Bunge Mon.* i. 39; ii. 51.

KUNAWAR and WEST TIBET, alt. 12–16,000 ft., alpine region.

Tufts densely cæspitose at the crown of a thick woody rootstock. *Stipules* linear or lanceolate, $\frac{1}{2}$–$\frac{3}{4}$ in.; petiole 1–4 in. long, stramineous, glabrous, like the leaf-rachis, which is 3–6 in. long and becomes wiry in texture; leaflets 31–51, scattered, distant, rather caducous, $\frac{3}{8}$–$\frac{3}{4}$ in. long, glaucous with a few fine spreading hairs in the early stage. *Heads* many-flowered, sessile or short-peduncled; pedicels $\frac{1}{4}$–$\frac{1}{3}$ in.; bracts linear, exceeding the pedicels, *Calyx* tubular, $\frac{5}{8}$ in. long; teeth a third as long as the tube. *Corolla* under an inch long; wings distinctly shorter than the standard, and keel than the wings. *Pod* oblong, turgid, glabrous, $\frac{1}{2}$–$\frac{3}{4}$ in. long, bilocular, 15–20-seeded, narrowed suddenly at both ends.

56. **A. bakuensis,** *Bunge. Mon.* i. 37; ii. 45; heads long-peduncled, leaflets linear finely downy, leaf-rachis not at all indurated, calyx-teeth setaceous, pod subsessile. *Boiss. Fl. Orient.* ii. 283.

PUNJAB, subtropical zone; Salt range, *Fleming, Stewart.*—DISTRIB. Orient.

Leaves $\frac{1}{4}$–$\frac{1}{2}$ ft. long; petioles 2–6 in. long, densely clothed with short spreading hairs; leaflets 31–41, distant, opposite or alternate, glaucous, distinctly stalked, $\frac{1}{3}$–$\frac{3}{4}$ in. long; stipules lanceolate, $\frac{1}{2}$–$\frac{3}{4}$ in. *Racemes* many-flowered, laxer than in the other species; peduncle 2–12 in. long, finely downy; bracts linear-setaceous, $\frac{1}{2}$ in. long. *Calyx* tubular, downy, $\frac{5}{8}$ in. long; teeth a third as long as the tube. *Corolla* half as long again as the calyx, considerably tinged with purple; petals subequal. *Pod* oblong, densely silky, bilocular, 15–20-seeded, not seen mature.—Connects *Myobroma* with *Phaca.*

** *Stems distinct.*

57. **A. Candolleanus,** *Royle Ill.* 199, *non Boiss*; heads subsessile, leaflets 17–25, leaf-rachises indurated persisting long after the leaflets fall, pod linear-oblong narrowed from the middle to both ends. A. Royleanus, *Bunge Mon.* i. 30; ii. 34.

West Himalayas, temperate and alpine region, alt. 8–13,000 ft.; WEST TIBET, KUNAWAR, KASHMIR, GURWHAL, KUMAON.

Stems woody, not more than a few inches long, beset below the tufts of leaves with the copious ascending woody rachises of the old leaves with the lanceolate membranous stipules still persisting. *Leaves* 3–4 in. long; leaflets oblong, obtuse, glaucous, $\frac{1}{4}$–$\frac{1}{2}$ in. long, more or less silky; petioles 1–2 in., finely downy. *Heads* dense, many-flowered; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in., densely silky; bracts linear. *Calyx* $\frac{1}{2}$ in., densely silky; teeth linear, a third as long as the tube. *Corolla* an inch long; wings shorter than the standard, keel than the wings. *Pod* $\frac{3}{4}$–1 in. long, curved, short-stalked, firm, turgid, bilocular, 12–16-seeded.

A plant from Kumaon and Gurwhal, of which we have incomplete examples gathered by Falconer and Madden (var. *pindreensis*, Benth.) with the general habit and copious persistent indurated petioles of this species, but with a shorter pod rounded at both ends like the next, will probably prove distinct from both when fully known.

Bunge cites from '*Royle Ill.* p. 199,' *A. subcaulescens*, which he keeps up as a species, but says he has not seen. Royle has no such plant.

58. **A. pyrrhotrichus,** *Boiss. Diag.* ix. 73; *Fl. Orient.* ii. 290; heads distinctly peduncled, leaflets 41–51 clothed with long silky hairs, leaf-rachis not indurated nor persistent. *Bunge Mon.* i. 39; ii. 54.

HAZARA, 2–6000 ft., *Stewart.* PUNJAB, near Atok, *Gen. Eyre, Aitchison*—DISTRIB. Afghanistan.

Stems short, woody, densely clothed with long soft spreading fine pale brown hairs. *Stipules* $\frac{1}{2}$–$\frac{3}{4}$ in. long, lanceolate, silky; leaf-rachis including petiole $\frac{1}{2}$–1 ft. long, densely clothed with spreading hairs, much overtopping the heads; leaflets green, roundish or obovate-oblong, $\frac{1}{4}$–$\frac{3}{8}$ in. long, obtuse, with a minute mucro. *Heads* close, 6–12-flowered; peduncle 1–4 in.; pedicels short; bracts linear-setaceous, plumose. *Calyx* densely silky, $\frac{3}{4}$–$\frac{7}{8}$ in. long; teeth setaceous, nearly as long as the tube. *Corolla* half as long again as the calyx. *Pod* subsessile, dimidiate-oblong, densely silky, bilocular, 10–12-seeded.

59. **A. malacophyllus,** *Benth. MSS.*; heads shortly peduncled, leaflets 31–41 densely silky, leaf-rachises not indurated nor persistent, pod oblong narrowed suddenly at both ends. *Bunge Mon.* i. 36; ii. 61.

West Himalayas, temperate region, alt. 8–11,000 ft.; KASHMIR and KISTWAR.

Stems densely pubescent, usually short, but reaching a foot long. *Leaves* 2–4 in. long; leaflets close, oblong, obtuse, densely silky, $\frac{1}{4}$–$\frac{1}{2}$ in. long; stipules lanceolate, $\frac{3}{8}$–$\frac{1}{2}$ in. *Heads* close or rarely sublax; peduncles an inch or less; bracts linear-setaceous, exceeding the distinct pedicels. *Calyx* $\frac{1}{2}$ in., densely silky; teeth linear, a third the length of the tube. *Corolla* half as long again as the calyx; wings rather shorter than the standard; keel shorter still. *Pod* $\frac{1}{2}$ in. long, sessile, very turgid, firm, bilocular, silky, 8–10-seeded.

60. **A. anomalus,** *Bunge Mon.* i. 35; ii. 62; heads distinctly peduncled, leaflets 25–31 nearly glabrescent, leaf-rachises not indurated nor persistent.

WEST TIBET, *Falconer.*

Closely allied to the last, from which it mainly differs by its longer peduncles and fewer leaflets. *Leaves* 3–4 in. long; leaflets oblong, obtuse, $\frac{3}{8}$–$\frac{1}{2}$ in. long, the upper close, the lower distant, green, with a few short silky hairs; stipules lanceolate, $\frac{1}{2}$ in. long. *Calyx* $\frac{1}{2}$ in.; teeth setaceous, plumose, half as long as the tube. *Corolla* $\frac{3}{4}$–$\frac{7}{8}$ in.; proportion of the petals as in *A. malacophyllus*. *Ovary* linear, silky, nearly sessile; ovules about 20. *Pod* not seen.

SUBGEN. 8. **Ægacantha,** *Bunge.* Low shrubs, with basifixed hairs, stipules adnate at the base to the petiole, persistent rigid leaf-rachises without

any leaflet at the end, large yellow flowers in the axils of the leaves without any peduncles, gibbous calyces and naked stigmas. Included in Fischer's monograph in *Tragacantha*, from which they are separated by their pedicelled gibbous calyx.

* *Leaflets glabrescent or obscurely silky.*

61. **A. polyacanthus,** *Royle Ill.* 199, *non Wall. Cat.* 5934; spines short, stipules deltoid or lanceolate-deltoid, leaflets 9–13, flowers sessile in the axils of the leaves usually geminate, corolla twice as long as the calyx. A. Daltonianus, *Bunge Mon.* i. 44; ii. 69. A. psilocentrus, *Fisch.*; *Bunge Mon.* i. 44; ii. 70. A. scariosus, *Benth. MSS.*; *Bunge Mon.* i. 44; ii. 71. A. Grahamianus, *Royle Ill.* 199, t. 36, fig. 2; *Bunge Mon.* i. 44; ii. 68. A. Jacquemontii, *Bunge Mon.* i. 44; ii. 68.

Common in the north-west, ascending from the plains of the PUNJAB to 12,000 ft., reaching east to KUMAON and GHARWAL.—DISTRIB. Afghanistan.

A copiously-branched undershrub, with short branchlets armed with the crowded ascending old leaf-rachises, which are not more than 1½–2 in. long. *Leaflets* oblong, glabrescent or persistently slightly silky, pale glaucous green, rather thick in texture, often complicate, ¼–½ in. long. *Pedicels* silky, ⅛–¼ in. *Calyx* tubular, ½ in. long, glabrescent or thinly silky; mouth oblique; teeth short, linear. *Corolla* 1–1¼ in. long; wings shorter than the standard, and keel than the wings. *Pod* ½ in. long, dimidiate-oblong, turgid, sessile, bilocular, 15–20-seeded.

62. **A. cicerifolius,** *Royle*; *Bunge Mon.* i. 44; ii. 70; spines elongated, leaflets 31–41, stipules lanceolate or linear-lanceolate, flowers in peduncled heads, corolla not twice as long as the calyx. A. oplites, *Benth. MSS.* A. tenuispinus, *Bunge Mon.* i. 44; ii. 70. A. microphyllus, *Jacquem. MSS.*

West Himalayas, temperate and alpine region, alt. 10–17,000 ft.; NUBRA, LADAK, KASHMIR, GARWHAL, KUNAWAR, &c.

An undershrub, densely armed with the erecto-patent rigid stramineous leaf-rachises, which are ¼–½ ft. long. *Leaflets* finely silky at first, mostly glabrescent when mature, pale green, thick in texture, obtuse, sometimes emarginate, ascending, caducous, ¼–⅜ in. long, oblanceolate or obovate-oblong. *Flowers* usually 3–4 together on short peduncles from the axils of the leaves; pedicels ⅛–¼ in.; bracts linear or setaceous, exceeding the pedicels. *Calyx* ½–⅝ in., with a few adpressed black or brownish silky hairs; teeth setaceous, a third as long as the tube. Proportion of the *petals* as in the last. *Pod* ½–¾ in. long, oblong, turgid, bilocular, densely silky, narrowed to the point, 15–20-seeded.

** *Leaflets persistently densely silky.*

63. **A. multiceps,** *Wall. Cat.* 5937; main stems not produced, branchlets with densely crowded nodes, flowers 1–2 together in leaf-axils usually not peduncled, corolla twice as long as the calyx. *Bunge Mon.* i. 44, ii. 69.

West Himalayas, temperate zone, alt. 10–12,000 ft.; SIMLA, KUMAON, GARWHAL.

Tufts densely congested, armed with the very crowded ascending old leaf-rachises, which are 1½–3 in. long. *Stipules* ¼ in., lanceolate, adnate only at the very base; leaflets 21–31, mostly crowded, obovate-oblong, $\frac{1}{12}$–⅙ in. long, thick in texture, dull green, clothed with grey silky hairs. *Pedicels* $\frac{1}{12}$–⅛ in.; bracts linear, exceeding the pedicels. *Calyx* ⅜ in., thinly silky; teeth linear-setaceous, half as long as the tube. *Corolla* ¾ in.; standard exceeding wings and keel. *Pod* sessile, oblong, turgid, bilocular, 12–14-seeded, clothed with fine grey silky hairs.

64. **A. zanskarensis,** *Benth. MSS.*; main stems short, branchlets

with densely crowded nodes, flowers in short-peduncled heads, corolla half as long again as the calyx. *Bunge Mon.* i. 43, ii. 67.

West Himalayas, temperate and alpine region, alt. 10–14,000 ft.; ZANSKAR, *Thomson.*

A dichotomously-branched undershrub, with the old part of the stems densely beset with stiff persistent ascending leaf-rachises 3–4 in. long. *Stipules* lanceolate, ½ in. long; leaflets 21–25, close, oblong, obtuse, caducous, ¼–⅜ in. long, densely clothed on both sides with rather spreading short pale brown silky pubescence. *Flowers* up to a half-a-dozen in heads much overtopped by the leaves; pedicels ⅛ in., densely pubescent; bracts linear-setaceous, plumose. *Calyx* ½–⅝ in., tubular, densely silky; teeth setaceous, ¼ as long as the tube. *Corolla* ¾ in.; wings shorter than standard and keel than wings. *Ovary* oblong, silky, short-stalked; ovules about 20. *Pod* not seen.

65. **A. leptocentrus,** *Bunge Mon.* i. 44; ii. 69; main stems elongated, branchlets with densely crowded nodes, flowers 1–2 together in leaf-axils not peduncled, corolla twice as long as the calyx. A. leptacanthus, *Benth. MSS. non Boiss. & Buhse.*

West Himalayas, alpine region. PITI, alt. 14,000 ft., *Thomson*; HAZARA, *Winterbottom.*

A low undershrub, with branches clothed with very dense short pale brown spreading pubescence. *Leaf-rachises* erecto-patent, 2–3 in. long, persistently pubescent; leaflets 21–31, oblong, obtuse, ⅛–⅜ in. long, persistently matted on both sides with thick grey-brown silky pubescence. *Pedicels* ⅛ in., densely silky; bracts plumose, linear-setaceous. *Calyx* ½ in., densely silky; teeth linear-setaceous, a third as long as the tube. *Corolla* an inch long; keel much shorter than standard and wings. *Pod* oblong, ½–⅝ in., sessile, silky, turgid, bilocular, 12–14-seeded.

66. **A. bicuspis,** *Fisch. Mon. Trag. No.* 94; main stems elongated, nodes not crowded, flowers 1–3 together in the axils of the leaves not peduncled, corolla half as long again as the calyx. *Bunge Mon.* i. 43, ii. 69. A. lasiocladus, *Benth. MSS.*

HAZARA and WEST TIBET, temperate zone, *Winterbottom, Jacquemont, Falconer.*

General habit of *A. polyacanthus. Branches* clothed with dense spreading or deflexed pale brown silky hairs. *Spines* 1–2 in. long, stramineous, erecto-patent. *Stipules* ¼–⅜ in., lanceolate-cuspidate; leaflets 13–17, oblong, ¼–⅜ in. long, obtuse, or subacute, shaggy with dense pubescence like the stem. *Pedicels* very short. *Calyx* ½ in. long, shaggy with dense silky hairs like the stem. *Corolla* ⅝–¾ in.; wings and keel much shorter than the standard. *Pod* shaggy, subsessile, oblong, bilocular, ⅜–½ in. long, 8–10-seeded.

SUBGEN. 9. **Tragacantha,** *Bunge.* A low shrub with basifixed hairs, indurated spiny leaf-rachis, caducous leaflets and sessile calyx narrowed equally to the base.

67. **A. strobiliferus,** *Royle Ill.* 199; *Bunge Mon.* i. 83, ii. 146; *Camb. in Jacquem. Voy. Bot.* 39, t. 47, *not Lindl.*

West Himalayas, temperate and alpine region, alt. 8–13,000 ft.; PITI, KASHMIR, KUNAWAR.—DISTRIB. Afghanistan.

A copiously-branched undershrub, not more than a few inches high, densely armed with the ascending spine-tipped stramineous petioles, which are 1–2 inches long. *Stipules* membranous, deltoid, adnate to the petiole, like those of a rose, except at the tip; leaflets 11–13, oblanceolate, glaucous, rigid, acute, ¼–⅜ in. long, strigillose. *Flowers* a few sessile in the axil of each petiole, scarcely protruding

beyond the stipules. *Calyx* $\frac{1}{4}$ in. long, cleft down to the base, each lobe like a dense tuft of thick white pubescence. *Corolla* yellow, little exserted; petals equal, marcescent; standard panduriform. *Pod* sessile, silky, 3–4-seeded.

Bunge gives his *A. glabrifolius*, Mon. i. 93, ii. 167, gathered also by Griffith in Afghanistan, from the West Himalayas, on Falconer's authority. It has much longer petioles, longer flat glabrous leaflets, flowers of many nodes at the top of a short stem aggregated into a thick very dense oblong head.

SUBGEN. 10. **Cercidothrix,** *Bunge* (including Calycocystis). Herbaceous perennials, densely canescent with adpressed white bristly hairs fixed by the centre like those of *Indigofera*, moderately large yellow flowers and glabrous stigmas. Outlying representatives of a group of above 300 species, mostly Central Asian.

68. **A. peduncularis,** *Royle Ill.* 199; leaflets 21–25 distant narrow-oblong, racemes many-flowered lax in the lower part, calyx permanently tubular, pod linear very turgid unilocular many-seeded. *Bunge Mon.* i. 96, ii. 168.

WEST TIBET; Dras and Zanskar, alt. 9–12,000 ft., *Thomson, Henderson*; KUNAWAR, *Royle.*

Stems tall, erect, glabrous, firm, little branched, 1–2 ft. high, with only a few obscure adpressed bristles. *Leaves* 3–4 in. long; rachis channelled down the face; leaflets obtuse or subacute, $\frac{3}{8}$–$\frac{1}{2}$ in. long, pale green, glabrescent above, persistently strigillose below; stipules deltoid, free, membranous. *Racemes* 2–4 in. long, dense upwards, Phaca-like; peduncles finally $\frac{1}{2}$ ft. or more; pedicels very short, cernuous; bracts lanceolate, $\frac{1}{8}$ in., subpersistent. *Calyx* $\frac{1}{4}$ in., finely downy; teeth very short, upper deltoid, lower lanceolate. *Corolla* twice the calyx; keel and wings nearly equal, rather shorter than the standard. *Pod* sessile, firm, glabrous, very turgid, $\frac{1}{2}$–$\frac{3}{4}$ in. long, depressed down the keel, but the suture not intruded; seeds 15–20.

69. **A. subulatus,** *M. Bieb. Fl. Taur. Caucas.* ii. 193; leaflets 9–13 distant linear, racemes few-flowered lax, calyx permanently tubular, pod long cylindrical half-bilocular many-seeded. *Boiss. Fl. Orient.* ii. 481. A. anfractuosus, *Bunge Mon.* i. 125, ii. 218.

WEST TIBET, alpine region, alt. 12,000 ft., *Thomson, Henderson.*—DISTRIB. Afghanistan, Beloochistan, Crimea, West Siberia, Chinese Tartary.

Stems under a foot high, 2–3 times dichotomously forked, the branches divaricated, thinly clothed with minute white bristles. *Leaves* $\frac{1}{2}$–1 in. long; leaflets $\frac{1}{2}$–$\frac{3}{4}$ in. acute, firm, pale green, persistently strigillose on both sides; stipules linear, very minute. *Racemes* 3–12-flowered, 1–2 in. long; peduncles rigid, exceeding the leaves, clothed with mixed black and white adpressed hairs; pedicels very short; bracts minute, lanceolate, persistent. *Calyx* cylindrical, $\frac{1}{2}$–$\frac{5}{8}$ in. long, densely clothed with adpressed mixed black and white bristles; teeth minute, lanceolate. *Corolla* nearly twice the calyx; wings shorter than the standard; keel much shorter, the lamina not more than half as long as the claw. *Pod* cylindrical, 1–1$\frac{1}{2}$ in. long, canescent with similar bristles to those of the calyx and peduncle, firm, rostrate, 20–30-seeded, straight or slightly recurved, narrowed to a short stalk.

70. **A. nivalis,** *Kar. & Kir. Enum. Pl. Song. No.* 272; leaflets 13–17 close oblong, racemes many-flowered capitate, calyx becoming inflated, pod very small half-bilocular few-seeded. *Bunge Mon.* i. 137, ii. 234. A. Thomsonianus, *Benth. MSS.*

WEST TIBET, alpine region, alt. 11–16,000 ft.; Zanskar, Ladak, and Sassar, *Thomson, Stewart.*—DISTRIB. Central Siberia.

Root thick, woody. *Stems* $\frac{1}{4}$–$\frac{1}{2}$ ft., densely cæspitose, slender, finely canescent. *Leaf*

1–1½ in.; leaflets ⅛–⅜ in., obtuse, densely white-canescent on both sides; stipules small, lanceolate, cuspidate, free. *Flowers* 6–20, in a dense head, all ascending; peduncles 1–2 in., finely canescent; bracts lanceolate, shaggy, exceeding the very short pedicels. *Calyx* ½ in. membranous, tubular at first, densely silky, becoming much inflated after the petals fall; teeth short, lanceolate. *Corolla* nearly twice the calyx; wings shorter than the standard; keel shorter still. *Pod* ¼–⅜ in., oblique oblong, silky, distinctly stalked, 2–4-seeded, with the introverted suture reaching half through.

UNKNOWN SPECIES.

Of *A. cæruleus,* Hort. Paris; Bunge Mon. i. 103, ii. 184, a species near *A. Onobrychis,* supposed to have been raised in the Paris garden from Ceylon seeds, we know nothing. No doubt the locality is a mistake.

27. OXYTROPIS, DC.

Herbaceous perennials with odd-pinnate leaves, the flowers usually in dense heads. *Calyx* tubular or campanulate, with 5 subequal teeth. *Corolla* more or less exserted; standard longest; keel shortest, pointed with a distinct cusp. *Stamens* diadelphous; anthers uniform. *Ovary* sessile or stalked, many-ovuled; style abruptly incurved beardless, stigma capitate. *Pod* oblong or roundish, turgid, continuous longitudinally within, unilocular or rarely bilocular.—DISTRIB. Species about 100, spread through the North temperate zone.

SECT. I. **Hypoglottidei.** Flowers in dense peduncled heads. Leaflets not more than one from the same point.—Habit of *Astragalus,* section *Hypoglottis.*

* *Flowers purple, rarely yellow.*

1. **O. lapponica,** *Gaud. Fl. Helv.* iv. 545; stemless or short-stemmed, leaflets lanceolate 13–25, flowers in permanently dense heads, calyx nearly sessile, pod of the lower flowers or all the flowers deflexed. O. microrhyncha, *Benth. MSS.* Phaca lapponica, *DC. Prodr.* ii. 274.

WESTERN HIMALAYAS, frequent in the alpine and temperate regions, alt. 9–17,000 ft. SIKKIM, *Hook. fil.*—DISTRIB. Mts. of Europe and Siberia.

Stems often not developed, sometimes ¼–½ ft. long. *Leaves* 1–3 in. long; leaflets ⅛–⅜ in., green in the type, with a few adpressed white silky hairs or sometimes nearly glabrescent; stipules ⅛–¼ in., leaf-opposed, connate towards the base. *Peduncles* ¼–½ ft., with only a few adpressed hairs; flowers 6–20 in a dense rounded head; bracts minute, linear. *Calyx* ⅛–¼ in., coated with adpressed nearly black silky hairs; teeth linear, shorter than the tube. *Corolla* bright purple, ⅜–½ in. long; keel much shorter than the wings. *Pod* linear-oblong, ⅜–½ in. long, unilocular, keeled down the back, 5–6-seeded, clothed with a few obscure black or white hairs; stalk as long as the calyx-tube.

VAR. 1. *Jacquemontiana, Benth.*; stemless, very dwarf, the whole plant not more than 1–3 in. high, leaflets few small thick greenish, heads 1–3-flowered, corolla rather larger than in the type. A high alpine form.

VAR. 2. *humifusa, Kar. & Kir., sp.*; stemless, leaflets densely and persistently white-silky on both sides, calyx more densely silky, the black hairs mixed with copious white ones. O. glacialis, *Benth. MSS.*—Alpine zone of Kashmir and Western Tibet.

VAR. 3. *xanthantha, Baker*; general habit and leaves of the type, but calyx longer, with teeth quite as long as the tube and corolla yellow.—East Tibet; Lama Kongra, alt. 15,000 ft., *Hook. fil.*

2. **O. mollis,** *Royle Ill.* 198; stemless, tall, leaflets densely white-

silky 13–25 oblong or lanceolate-oblong, heads finally sublax, corolla half as long again as the calyx, pods ascending. O. floribunda, *Benth. in Royle Ill.* 198. Astragalus vesiculosus, *Jacquem. MSS.*

West Himalayas, alpine region, alt. 10–12,000 ft. ; LAHUL, ZANSKAR, KUNAWAR, &c.

Tufts $\frac{1}{2}$–1 ft. high, crowded at the top of a woody rootstock. *Leaves* long-petioled, 2–3 in. long ; leaflets $\frac{1}{4}$–$\frac{1}{2}$ in. long, moderately thick, pale green, densely clothed on both sides with persistent adpressed white silky hairs ; stipules lanceolate or deltoid-cuspidate, densely silky. *Peduncles* usually much overtopping the leaves ; heads finally 2–3 in. long ; pedicels very short ; bracts minute, linear. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in long, densely clothed with mixed black and white silky hairs. *Pod* $\frac{1}{2}$–$\frac{5}{8}$ in. long, oblong-cylindrical, unilocular, distinctly stalked, 6–8-seeded.

3. **O. Thomsoni,** *Benth. MSS.* ; stemless, tall, leaflets lanceolate densely white-silky 13–51, heads finally sublax, corolla twice as long as the calyx, pods ascending.

West Himalayas, temperate and alpine region, alt. 7–15,000 ft. ; LAHUL, LADAK, KASHMIR.

General habit of *O. mollis.* *Leaves* long-petioled, 4–6 in. long ; leaflets grey-green, narrower in proportion, $\frac{3}{4}$–1 in. long, not so thick nor densely silky as in the last ; stipules lanceolate, $\frac{1}{2}$ in. long. *Racemes* finally 3–4 in. long ; peduncles equalling or overtopping the leaves ; pedicels $\frac{1}{24}$–$\frac{1}{12}$ in. ; bracts linear, small. *Calyx* $\frac{1}{4}$–$\frac{3}{8}$ in., densely clothed with mixed black and white silky hairs ; teeth plumose, the lower nearly as long as the tube. *Pod* oblong-cylindrical, unilocular, 4–6-seeded, with a few minute adpressed white hairs ; stalk as long as the calyx-tube.

** *Flowers mostly yellow, rarely varying to purple.*

4. **O. densa,** *Benth. MSS.* ; acaulescent, very dwarf, leaflets 15–17 minute densely-silky, heads few-flowered short-peduncled, pod ovate-cylindrical bilocular.

WEST TIBET, alpine region, alt. 16–17,000 ft., *Thomson, Strachey.*

Tufts densely cæspitose from a woody root, the whole plant not more than 1–1$\frac{1}{2}$ in. above the surface. *Leaves* under $\frac{1}{2}$ in. long ; leaflets $\frac{1}{12}$ in. long, close, oblong, thickly matted with persistent grey-silky hairs ; stipules deltoid, membranous, 1$\frac{1}{2}$–2 in., connate downwards. *Heads* 3–6-flowered ; peduncles densely silky, $\frac{1}{4}$–$\frac{1}{2}$ in. ; pedicels very short. *Bracts* small, linear. *Calyx* $\frac{1}{6}$ in., densely silky ; tube campanulate ; teeth linear, shorter than the tube. *Corolla* half as long again as the calyx. *Pod* sessile, finely silky, narrowed gradually from the middle to the point, turgid, 5–6-seeded.

07547

5. **O. Stracheyana,** *Benth. MSS.* ; stemless, very dwarf, leaflets 5–7 densely silky, heads few-flowered short-peduncled, pod round-oblong turgid unilocular.

WEST TIBET, alpine region ; Darma Yankti, alt. 15,500 ft., *Strachey & Winterbottom.*

Whole plant not above a couple of inches above the surface. *Stipules* deltoid, membranous, minute ; leaflets thick, complicate, oblong, $\frac{1}{8}$–$\frac{1}{6}$ in. long, densely matted with grey-brown silky hairs. *Heads* short-peduncled, 2–3-flowered ; bracts minute ; pedicels very short. *Calyx* $\frac{3}{8}$ in. long, tubular, densely clothed with ascending grey silky hairs ; teeth linear, $\frac{1}{3}$–$\frac{1}{4}$ tube. *Corolla* half as long again as the calyx. *Pod* $\frac{1}{2}$ in. long, sessile, 3–4-seeded, densely clothed with long persistent pale brown silky hairs.

6. **O. tatarica,** *Jacquem. MSS.* ; stemless, leaflets small 13–21 densely matted with white silky hairs, heads dense long-peduncled, bracts minute, pod sessile inflated unilocular round-oblong.

West Tibet, alpine region, frequent, alt. 13–17,000 ft.; NUBRA, ZANSKAR, PITI, PARANG, LADAK, &c.

Densely tufted, the whole plant 3–4 in. high. *Leaves* ½–1 in. long; leaflets close, except the lowest, oblong or oblanceolate-oblong, ⅛–⅜ long, thick, densely persistently matted with white silky hairs on both sides; stipules minute, deltoid, silky. *Flowers* 20–40, in very dense heads; pedicels scarcely any; bracts minute, linear, white-plumose. *Calyx* ⅙–¼ in., densely white-silky; teeth nearly or quite as long as the tube. *Corolla* not more than half as long again as the calyx, usually all yellow, rarely purple or the keel tipped with purple; standard oblong-spathulate, exceeding the wings and keel. *Pod* much inflated, membranous, sessile, ¼–⅜ in. long, 5–6-seeded, shaggy with loose dense white silky hairs.

7. **O. cachemirica,** *Camb. in Jacquem. Voy. Bot.* 38, t. 44; stem short, leaflets 13–21 oblong-lanceolate densely white-silky, heads dense long-peduncled, bracts distinct lanceolate, pod sessile inflated round-oblong unilocular.

WEST TIBET and KASHMIR, temperate zone, alt. 8–10,000 ft.—DISTRIB. Central Siberia.

Whole plant ¼–½ ft. high. *Stems* ascending from a woody rootstock, finely pubescent. *Leaves* 1–2 in. long; leaflets ⅜–½ in. long, clothed on both sides with loose white silky hairs; stipules lanceolate or deltoid, connate downwards. *Flowers* 12–30 in a dense head; pedicels very short. *Calyx* ⅜ in. long, densely white-silky; teeth linear, nearly or quite as long as the tube. *Corolla* half as long again as the calyx. *Pod* just like that of the last but rather larger.

8. **O. Meinshausenii,** *Schrenk*; *Led. Fl. Ross.* i. 786; stem distinct, leaflets 17–31 thin large oblong green pubescent, heads dense long-peduncled, bracts conspicuous, pod short-stalked oblong unilocular. *Bunge Rel. Lehm.* 76.

WEST HIMALAYAS, temperate region; valley of Kishengunga, alt. 9–11,000 ft., *Stewart*.—DISTRIB. Siberia.

Stems a foot or more high, at first thinly pilose. *Leaves* 3–4 in. long; leaflets ½–¾ in. long, obtuse, thinly clothed with rather long whitish hairs on both sides; stipules ¼–½ free, lanceolate or oblong. *Flowers* 12–20 in a dense head; peduncles erect, 4–6 in. long; pedicels $\frac{1}{24}$–$\frac{1}{12}$ in.; bracts linear, ⅛–¼ in. long, ciliated with black hairs. *Calyx* ⅜ in., tubular, thinly clothed with adpressed black hairs; teeth linear, half as long as the tube, black-plumose. *Corolla* twice as long as the calyx. *Pod* oblong, turgid, ¼–⅜ in. long, straight, 6–8-seeded, with a few dark silky hairs.

Dr. Hooker procured from Nipalese Tibet flower-heads of a fifth yellow-flowered species which, as far as the material goes, matches the Siberian *O. argentata, Led.* It differs from *O. Meinshausenii* by larger bracts, longer calyx with linear teeth as long as the tube, corolla shorter in proportion, not more than half as long again as the calyx. These two represent in the Himalayas the group of *O. campestris.*

SECT. 2. **Verticillares,** *DC.* Herbaceous perennials with flowers in dense heads, with leaflets often in pairs from the same point, so that they are whorled when the nodes are opposite on the two sides of the leaf-rachis.

9. **O. microphylla,** *DC. Prodr.* ii. 279; *Led. Fl. Ross.* i. 578. O. chiliophylla, *Royle Ill.* 198; *Camb. in Jacquem. Voy. Bot.* 38, t. 45.

West Himalayas, alpine region, alt. 11–16,000 ft.; ZANSKAR, PITI, SASSAR, NUBRA, KUNAWAR, &c.; SIKKIM, *Hook. fil.*

Stemless, erect, ¼–¾ ft. high, the tufts densely cæspitose at the top of a woody rootstock, the deltoid imbricated stipules clothed with dense tufts of long white silky hairs. *Leaf* short-petioled, 1½–3 in. long; leaflets crowded, linear-oblong, ⅛–¼ in. long, subcoriaceous, grey-green, gland-dotted, with fine deciduous pubescence, the edges much reflexed. *Peduncles* equalling or overtopping the leaves; flowers 4–15, the heads

at first close, becoming 2–3 in. long when they expand. *Calyx* $\frac{3}{8}$ in. long, tubular, clothed with large sessile glands, nearly glabrous; teeth short, linear, pubescent. *Corolla* bright purple, twice the calyx. *Pod* half-bilocular, sessile, linear, turgid, recurved, densely gland-dotted, glabrous, bilocular; seeds 20–30.

SECT. 3. **Phacoidei.** Herbaceous caulescent perennials, with flowers in elongated racemes.—Habit of *Astragalus*, section *Phaca*.

10. **O. diffusa,** *Led. Alt.* iii. 281; *Icon. Ross.* t. 451. O. glabra, *DC. Astrag.* No. 31, t. 8; *Prodr.* ii. 280.

WEST TIBET, temperate region, alt. 7–8000 feet.—DISTRIB. West Siberia.

Caulescent, 1–2 ft. high. *Stems* copiously branched, firm, slender, zigzag, terete, glabrous. *Leaves* 2–3 in. long; leaflets 9–13, lanceolate, $\frac{1}{2}$–1 in. long, green, rather thick, acute, glabrous or with only a few minute obscure hairs; stipules minute, free, deltoid, foliaceous. *Racemes* 2–4 in. long; pedicels very short; bracts minute, lanceolate. *Calyx* $\frac{1}{8}$ in., campanulate, with a few adpressed black and white hairs. *Corolla* yellow, twice the calyx. *Pod* $\frac{3}{8}$–$\frac{1}{2}$ in. long, oblong, sessile, turgid, unilocular, straight, glabrous, 6–10-seeded.

28. TAVERNIERA, DC.

Much-branched undershrubs. *Leaves* simple or 3-foliolate. *Flowers* in lax racemes. *Calyx-tube* turbinate; teeth 5, distinct, setaceous from a deltoid base. *Corolla* marcescent, much exserted; standard obovate; wings small, much shorter; keel obtuse, as long as the standard. *Stamens* monadelphous; anthers uniform. *Ovary* stalked, 2–4-ovulate; style long, filiform, inflexed, stigma minute, capitate. *Pod* of 1–4 flattened indehiscent densely muricated joints.—DISTRIB. Species 3–4, reaching Egypt and Abyssinia.

1. **T. nummularia,** *DC. Prodr.* ii. 339; *Mem. Leg.* vi. t. 52; *Boiss. Fl. Orient.* ii. 508. Hedysarum nummularifolium, *DC. in Ann. Sc. Nat.* iv. 102. H. sparteum, *Burm. Fl. Ind.* 166, t. 51, fig. 2? T. spartea, *DC. loc. cit.*? Onobrychis diffusa, *Camb. in Jacquem. Voy. Bot.* t. 49. T. cuneifolia, *Arn. in Wight Ic.* t. 1055; *Dalz. & Gibs. Bomb. Fl.* 67. T. gonoclada and T. ephedroides, *Jaub. & Spach. Ill.* t. 61 and 62. Hedysarum Gibsoni, *Grah. Cat. Bomb. Pl.* 49.

Plains of SCINDE and the PUNJAB.—DISTRIB. Afghanistan, Orient.

A copiously-branched undershrub, 1–2 ft. high, with slender finely canescent terete branches. *Leaves* shortly petioled, usually 3-foliolate; leaflets very variable in size, $\frac{1}{4}$–1 in. long, obovate-oblong or nearly round, thick, pale green, thinly canescent beneath, the side ones not opposite; stipules free, minute, lanceolate, scariose. *Racemes* few- or many-flowered, usually exceeding the leaves. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in., thinly silky. *Corolla* red, glabrous, $\frac{3}{8}$–$\frac{1}{2}$ in. *Joints* of pod 1–4, roundish.

29. EBENUS, Linn.

Villous herbs or undershrubs. *Leaves* odd-pinnate; leaflets entire, exstipellate; petiole often spinose. *Flowers* red, in dense peduncled axillary spikes. *Calyx-teeth* 5, subequal, setaceous, plumose, exceeding the tube. *Corolla* much shorter than the calyx; standard broad; keel obtuse, as long as standard; wings short. *Stamens* monadelphous, the upper free at the base; anthers uniform. *Ovary* sessile, 1-ovulate; style filiform, incurved, stigma capitate. *Pod* flat, oblong, included in the calyx-tube, membranous, indehiscent.—DISTRIB. Species 8, Oriental and Mediterranean.

1. **E. stellata,** *Boiss. Diag.* ii. 100; *Fl. Orient.* ii. 557. E. tragacan-

thoides, *Jaub. & Spach. Ill.* iii. 68, *t.* 254. E. horrida and ferruginea, *Jaub. & Spach. Ill.* p. 159–160.

PUNJAB-HIMALAYA, alt. 4–8000 ft., *Stewart.*—DISTRIB. Persia, Afghanistan, Beloochistan.

A low undershrub, densely armed with woody erecto-patent spines 1–1½ in. long. *Leaves* shorter than the spines, digitately trifoliolate; leaflets lanceolate, subcoriaceous, sericeous, ½–¾ in. long. *Flowers* sessile in dense stalked heads, on peduncles at most as long as the spines, each head surrounded by a whorl of large lanceolate bracts. *Calyx* ⅓ in., densely clothed with long brown silky hairs.

30. GEISSAPSIS, W. & A.

Annuals. *Leaves* with two pairs of leaflets. *Flowers* in terminal racemes, with large membranous persistent veined ciliated persistent bracts. *Calyx* deeply 2-lipped; upper lip entire, lower obscurely toothed. *Corolla* 2–3 times calyx; standard roundish; keel obtuse. *Stamens* monadelphous; anthers uniform. *Ovary* short-stalked, biovulate; style incurved, stigma minute capitate. Joints of *pod* 1–2, turgid in the middle, with a distinct flat border, reticulately-veined, 1-seeded, indehiscent.—DISTRIB. Sp. 3, the other Trop. African.

1. **G. cristata,** *W. & A. Prodr.* 218; flowers not more than ⅓ as long as the long-bristled bracts. *Dalz. & Gibs. Bomb. Fl.* 62. Zornia disperma, *Grah. in Wall. Cat.* 5663. Hedysarum bijugum, *Klein MSS.*

Plains of WESTERN PENINSULA, CEYLON, AVA, MARTABAN, TENASSERIM, and PEGU.

A densely cæspitose trailing annual, with slender naked branches ½–2 ft. long. *Leaves* petioled, with a very short rachis; leaflets obovate, oblique, glabrous, truncate, ¼–⅓ in. long; stipules lanceolate, membranous, distinctly spurred. *Heads* dense, terminal, ½–2 in. long; bracts much imbricated, ½ in. broad, reniform, ciliated with firm yellow bristles $\frac{1}{12}$ in. long. *Calyx* $\frac{1}{24}$ in. long. *Corolla* twice the calyx. *Joints* 1–2, ⅛ in. long.

2. **G. tenella,** *Benth. in Hohen. Pl. Ind. Or.* No. 659; flowers nearly or quite as long as the short-bristled bracts.

WESTERN PENINSULA.

Habit of the last, but much smaller. *Leaflets* all four nearly from the same point, ⅛–¼ in. long, obliquely obovate, truncate, glabrous. *Racemes* copious, terminal, peduncled, 4–12-flowered; bracts obliquely oblong, less imbricated, ⅛–⅙ in. broad, strongly veined, ciliato-denticulate. *Calyx* $\frac{1}{24}$ in., deeply cleft. *Corolla* yellow, ⅛ in., *Joints* 1–2, with a flat edge, round, with a turgid centre.

31. ONOBRYCHIS, Gaertn.

Herbs. *Leaves* numerous, odd-pinnate, exstipellate. *Flowers* numerous, red, in long-peduncled axillary racemes. *Calyx-tube* campanulate; teeth 5, distinct. *Corolla* much exserted; standard broad; wings short; keel obtuse. *Stamens* monadelphous; anthers uniform. *Ovary* sessile, 1–2-ovulate; style filiform, incurved, stigma terminal minute. *Pod* compressed, reniform, indehiscent, 1–2-seeded, alveolate or echinate.—DISTRIB. Species about 50, European and Oriental.

1. **O. Stewartii,** *Baker.*

PUNJAB; Hazara, *Dr. Stewart.* Rawul Pindee, *Dr. Aitchison.*

Stems slender, 1½–2 ft., glabrescent. *Leaf*-rachis 3–4 in. long, including distinct

petiole; leaflets 9–11, oblanceolate, subacute, distant, $\frac{1}{2}$–$\frac{3}{4}$ in. long, obscurely canescent; stipules linear, minute. *Racemes* long-peduncled, 6–9 in. long, lax; buds crowded; pedicels very short; bracts linear, minute. *Calyx* campanulate, $\frac{1}{12}$ in., silky; teeth lanceolate. *Corolla* 3–4 times calyx; standard glabrous, veined. *Pod* reniform, turgid, $\frac{1}{6}$–$\frac{1}{5}$ in., 1-seeded; faces woody, deeply alveolate; edge muricated with close minute spines. A second species, of which we have a scrap from Hazara, gathered by Winterbottom, with oblong obtuse leaflets and a much larger calyx and corolla agrees, as far as the material goes, with *O. heterophylla,* C. A. Meyer; Led. Fl. Ross, i. 711, from Persia and the Caucasus.

32. **LESPEDEZA,** Mich.

Herbs or undershrubs. *Leaves* exstipellate, trifoliolate. *Flowers* copious, in racemes, or crowded in the leaf-axils. *Calyx-tube* campanulate; teeth lanceolate or linear. *Corolla* exserted; standard broad; keel obtuse or acute. *Staments* diadelphous; anthers uniform. *Ovary* sessile or stipitate, 1-ovulate; style long, filiform, incurved; stigma minute, terminal. *Pod* small, oblong, compressed, 1-seeded, reticulato-venose, indehiscent.—DISTRIB. Species 20–25, the others Siberian, Chinese, Japanese, and N. American, one Javan. Monographed lately by Maximowicz.

SUBGEN. **Eulespedeza.** *Keel* obtuse, not much incurved.

1. **L. sericea,** *Miq. Ann. Mus. Lug. Bat.* iii. 49; petiole short, leaflets small linear-cuneate 4–6 times as long as broad grey- or white silky beneath, flowers 2–4 congested in the leaf-axils, pod small sessile. Hedysarum sericeum, *Thunb. Jap.* 289. Aspalathus cuneata, *Don Prodr.* 246. L. cuneata, *G. Don, Gen. Syst.* ii. 307. Anthyllis cuneata, *Dum. Bot. Cult.* vi. 100. L. juncea, *Wall. Cat.* 5743; *DC. Prodr.* ii. 348 *in part, non Pers.* L. argyræa, *Sieb. et Zucc. Abh.* vi. 2, 120.

Along the Himalayas from HAZARA and KASHMIR to ASSAM, alt. 3–8000 ft.—DISTRIB. China, Japan, N. Australia.

An erect undershrub, 2–3 ft. high, with tough long slender branches. *Leaves* ascending, crowded; leaflets $\frac{1}{4}$–$\frac{1}{2}$ in. long, rigidly coriaceous, truncate or emarginate, narrowed gradually in the lower half, very variable in vestiture, usually glabrous above, clothed with adpressed grey or white silky hairs below, rarely both sides clothed with loose white pubescence; petiole $\frac{1}{8}$ in. *Flowers* 2–4, on short pedicels in the axils all down the branch; bracteoles linear, minute. *Calyx* $\frac{1}{12}$–$\frac{1}{8}$ in., canescent; teeth linear-subulate, very long. *Corolla* twice the calyx, white, tinged with purple. *Pod* $\frac{1}{8}$ in., thinly silky; style twice its length,

2. **L. juncea,** *Pers. Ench.* ii. 318; petiole short, leaflets small oblanceolate 3–4 times as long as broad thinly grey-silky beneath, flowers 2–6 in umbels sessile or shortly peduncled in the leaf-axils, corolla small, pod small sessile. *DC. Prodr.* ii. 348 *in part, non Wall.* Hedysarum junceum, *Linn. fil. Dec.* i. t. 4. L. variegata and L. kanaorensis, *Camb. in Jacquem. Voy. Bot.* 42, t. 50, 51.

KASHMIR and KUNAWAR, temperate region, alt. 4–8000 ft.—DISTRIB. Siberia, North China.

Stems slender, 1–2 ft. high, finely downy, erect or decumbent. *Leaves* not nearly so crowded as in the last; leaflets $\frac{1}{4}$–$\frac{3}{4}$ in. long, rigidly subcoriaceous, obtuse, narrowed gradually in the lower half; petioles $\frac{1}{8}$–$\frac{1}{4}$ in. *Umbels* usually sessile, produced far down the branches. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in., canescent; teeth linear-setaceous, 3–4 times the tube. *Corolla* twice the calyx. *Pod* and style as in *L. sericea.*

3. **L. Gerardiana,** *Grah. in Wall. Cat.* 5744; petiole short, leaflets ob-

lanceolate grey-silky below, umbels sessile or short-peduncled in the axils of the leaves, corolla large, pod small sessile.

Along the Himalayas, temperate region, alt. 5–10,000 ft.; SIMLA and KUMAON to SIKKIM.

Stems 1–3 ft., densely pubescent. *Leaves* moderately close, ascending; leaflets $\frac{1}{2}$–$\frac{3}{4}$ in. long, rigidly coriaceous, glabrescent on the upper side, densely grey-silky below; petioles $\frac{1}{8}$–$\frac{1}{4}$ in. *Umbels* 4–8-flowered, usually sessile; bracteoles linear, half as long as the calyx. *Calyx* $\frac{1}{14}$ in., densely pubescent; teeth linear-subulate, 2–3 times the tube. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in.; keel tipped with purple. *Pod* considerably shorter than the calyx.

4. **L. elegans,** *Camb. in Jacquem. Voy. Bot.* 43, t. 52; upper leaves suppressed, petiole produced, leaflets oblong grey-silky beneath, umbels sessile, pod small sessile. *Maxim. Synop. Gen. Lesp.* 40.

KASHMIR, temperate region, alt. 5–6000 ft., *Jacquemont, Thomson.*

Stems 2–3 ft., finely downy. *Petiole* $\frac{1}{2}$–$\frac{3}{4}$ in.; leaflets $\frac{1}{2}$–$\frac{3}{4}$ in. long, obtuse, glabrescent above, densely grey-silky beneath. *Flowers* 6–8, in sessile umbels, rarely in short racemes, reaching low down the branches and forming at the top a close leafless panicle. *Calyx* $\frac{1}{6}$–$\frac{1}{4}$ in., densely pubescent; teeth linear-subulate, very long. *Corolla* half as long again as the calyx. *Pod* $\frac{1}{6}$ in. long, oblong, downy.

5. **L. elliptica,** *Benth. Cat. Griff. Pl.* No. 1745; petiole produced, leaflets large obovate-oblong thinly grey-canescent beneath, flowers in peduncled racemes the upper panicled, pod stipitate exserted. *Maxim. Synops. Gen. Lesp.* 27.

KHASIA, temperate region, alt. 5–6000 ft., *Griffith, Hook. fil. and Thomson.*

Stems woody, reaching several feet high, finely pubescent. *Leaves* not crowded; leaflets subcoriaceous, 1–1$\frac{1}{2}$ in. long, obtuse, green, glabrous above, grey, finely downy below; petiole 1–1$\frac{1}{2}$ in. *Racemes* many-flowered, close or lax, the peduncles sometimes as long as the leaves; pedicels shorter than the calyx; bracteoles linear, as long as the tube. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., densely canescent; teeth lanceolate, acute, twice as long as the tube. *Corolla* deep red, twice as long as the calyx. *Pod* oblong, $\frac{1}{4}$ in. long, finely downy, distinctly stalked.—Very near the common East Asian *L. bicolor*, Turcz. Led. Fl. Ross. i. 715 (*L. viatorum*, Champion), from which it differs mainly by its long acute calyx-teeth.

6. **L. tomentosa,** *Sieb.*; *Maxim. Synops.* 50; petiole short, leaflets large obovate-oblong densely downy beneath, flowers in peduncled racemes, pod sessile included. Hedysarum tomentosum, *Thunb. Fl. Jap.* 286. L. glomerata, *Hornem.*; *DC. Prodr.* ii. 350.

WESTERN HIMALAYA, temperate region, alt. 6–7000 ft., *Edgeworth.* —DISTRIB. China, Japan, Korea.

Stems 2–3 ft., erect, densely pubescent. *Leaves* distant; leaflets 1–2 in. long, obtuse, thick, subcoriaceous, at first thinly silky above, densely silky, and the veins raised beneath; petioles 1–$\frac{1}{2}$ in.; stipules subulate, persistent. *Racemes* distinctly peduncled, 2–4 in. long, moderately close, rarely congested, sessile (*L. glomerata*, Horn.); pedicels very short. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., densely pubescent; teeth linear-subulate, 3–4 times the tube. *Corolla* whitish. half as long again as the calyx; standard not longer than the wings and keel. *Pod* shorter than the calyx, oblong, pubescent.—Very near *L. hirta*, Elliott, of North America.

SUBGEN. **Oxyramphis,** *Wall.* *Keel* acute and much incurved, like that of a Crotalaria. (*Campylotropis*, Bunge.)

7. **L. macrostyla,** *Baker*; petiole short, leaves small thinly clothed be-

neath with whitish silky hairs, calyx and large pod densely clothed with spreading hairs. Oxyramphis sericea, *Grah. in Wall. Cat.* 5349. Lespedeza sericea, *Royle MSS. non Miquel.* Crotalaria macrostyla, *Don Prodr.* 242. Oxyramphis macrostyla, *Wall. Cat.* 5348, *non Lindley.* L. Royleana, *Miquel Ann. Mus. Lug. Bat.*, iii. 50. O. stenocarpa, *Klotzsch Reise Pr. Wald. Bot.* 158, t. 1, fig. 2.

HIMALAYAS, tropical and temperate zones, alt. 2–7000 ft.; SIMLA and GURWHAL to KHASIA.

An undershrub, 3–4 ft. high, with woody densely pubescent branches. *Petiole* $\frac{1}{2}$–$\frac{1}{4}$ in.; leaflets obovate-cuneate, rigidly subcoriaceous, $\frac{1}{4}$–$\frac{3}{4}$ in. long, grey, glabrescent, venose above, usually persistently silky, rarely (*O. macrostyla*, Wall.) subglabrescent below, broadly rounded, sometimes deeply emarginate at the point, the petiolule of the end one not more than $\frac{1}{8}$ in. *Racemes* short, dense, many-flowered, catkin like when unexpanded, the silky ovate bracts hiding the buds; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in., densely silky. *Calyx* $\frac{1}{8}$ in.; teeth lanceolate, twice the tube. *Corolla* deep red, three times the calyx. *Pod* short-stalked, $\frac{3}{8}$–$\frac{1}{2}$ in. long, narrowed to both ends; style persistent, $\frac{1}{2}$ in. long, densely plumose in the lower half.

8. **L. eriocarpa,** *DC. Prodr.* ii. 349; petiole produced, leaflets small thinly grey-canescent beneath, calyx and small pod clothed with adpressed silky hairs. Oxyramphis virgata, *Wall. Cat.* 5350. O. macrostyla, *Lindl. Bot. Reg.* xxxii. t. 28, *non Wall.* L. paniculata, *Royle MSS.* Desmodium angulatum, *Wall. Cat.* 5729 M.

HIMALAYAS, temperate and tropical zones, alt. 3–9000 ft.; HAZARA and KASHMIR to KHASIA and SIKKIM.

A copiously-branched erect shrub, 3–4 ft. high, with slender silky angular furrowed branchlets. *Petioles* $\frac{1}{2}$–$1\frac{1}{2}$ in.; leaflets obovate-cuneate, $\frac{1}{2}$–1 in. long, rigidly subcoriaceous, green, glabrous, reticulato-venose above, broadly rounded at the apex, the end one on a petiolule $\frac{1}{4}$–$\frac{1}{2}$ in. long; uppermost leaves reduced or suppressed. *Racemes* copious, peduncled, not dense, many-flowered, 2–4 in. long; bracts not exceeding buds; pedicels $\frac{1}{6}$–$\frac{1}{4}$ in. *Calyx* $\frac{1}{6}$ in; teeth linear-subulate, twice the tube. *Corolla* deep purple-red, $\frac{3}{8}$–$\frac{1}{2}$ in. *Pod* $\frac{1}{4}$ in., long, minutely stalked, more coriaceous than in the last; style as long as the pod, slightly pubescent near the base.—*L. paniculata*, Royle, is a mere form, with lax racemes and longer pedicels.

9. **L. Thomsoni,** *Benth. MSS.*; petiole produced, leaflets large densely argenteo-canescent beneath, calyx and small pod finely grey-silky.

KHASIA, temperate region, alt. 5000 ft., *Hk. fil. & Thomson, Lobb.*

Habit of the last, to which it is closely allied. *Petiole* 1–2 in.; leaflets oblong, 1–2 in. long, subcoriaceous, obtuse, green, glabrescent, less venose above. Upper *leaves* suppressed or much reduced, so that the racemes form a terminal panicle. *Bracts* $\frac{1}{8}$ in., linear, subpersistent, canescent on the back; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in. *Calyx* $\frac{1}{8}$ in.; teeth lanceolate, as long as the tube. *Corolla* $\frac{3}{8}$ in., deep red. *Pod* $\frac{1}{6}$–$\frac{1}{4}$ in. long, shortly stipitate, finally glabrescent, subcoriaceous; style $\frac{1}{4}$ in., not at all plumose.

SPECIES UNKNOWN TO ME.

L. DECORA, *Kurz in Journ. Asiat. Soc. Beng.* 42, 2, 231. An erect shrub, 3–5 ft. high, with angular stems clothed with adpressed fulvous down. *Stipules* linear-subulate $\frac{1}{4}$ in.; petiole 1–$1\frac{1}{2}$ in.; leaflets obovate-oblong, obtuse with a mucro, chartaceous, 1–$1\frac{1}{2}$ in. long, glabrous and dark green above, glaucescent and faintly pubescent below. *Racemes* short, but slender, fulvo-pubescent; bracts ovate-lanceolate, cuspidate, $\frac{1}{12}$ in. long, persistent, glanduloso-pilose. *Calyx* $\frac{1}{4}$ in., fulvo-pubescent; teeth ovate-acuminate. *Corolla* twice length of calyx, blue. Immature *pod* oblique ovoid, compressed, shortly sericeous. MARTABAN, *Kurz.*

L. PARVIFLORA, *Kurz in Journ. Asiat. Soc. Beng.* 42, 2, 231. A shrub, with angular silky branches. *Stipules* linear-subulate, $\frac{1}{8}$ in.; petiole canescent, $\frac{1}{4}$ in.;

leaflets ovate-elliptic, $\frac{1}{2}$–1 in. long, chartaceous, dark green and glabrous above, glaucescent and pilose below. *Racemes* axillary, stiff, fulvo-pubescent, twice as long as the leaves; bracts caducous; pedicels very short. *Calyx* densely fulvo-pubescent, $\frac{1}{6}$ in.; teeth subulate. *Corolla* scarcely twice as long as the calyx, probably blue. Immature *pod* oblique ovoid acuminate, silky. MARTABAN, Rev. F. Mason, ex Kurz loc. cit.

I cannot separate from *L. tomentosa* by the description *L. pinetorum*, Kurz in Journ. Asiat. Soc. Beng. 42, 2, 231, from Martaban.

33. **ALHAGI,** Desv.

Low shrub. *Leaves* simple. *Flowers* axillary. *Calyx* campanulate; teeth 5, distinct, minute. *Corolla* exserted; standard broad; keel obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* linear, sessile, 6–8-ovulate; style filiform, incurved; stigma minute, capitate. *Pod* linear, subcontinuous or moniliform; joints oblong, small, turgid, smooth.—DISTRIB. Species 1, spread from Songaria to Greece and Nubia.

1. **A. maurorum,** *Desv.*; *DC. Prodr.* iii. 352; *Wall. Cat.* 5760; *W. & A. Prodr.* 232; *Dalz. & Gibs. Bomb. Fl.* 67; *Boiss. Fl. Orient.* ii. 558. A. napaulensium, *DC. loc. cit.* A. mannifera, *Desv.*; *Jaub. & Spach. Ill.* t. 401. Hedysarum Alhagi, *Linn.*; *Roxb. Fl. Ind.* iii. 344. Manna hebraica and nepalensis, *Don Prodr.* 247.

PLAINS of the NORTH WEST PROVINCES, UPPER GANGES and CONCAN, ascending to 3000 ft. on the Kishengunga.

A low shrub, armed with copious subpatent hard pungent spines $\frac{1}{2}$–1 in. long. *Leaves* simple, drooping from the base of the spines or branches, oblong, obtuse, rigidly coriaceous, glabrous. *Flowers* 1–6 from a spine, on short pedicels. *Calyx* glabrous, $\frac{1}{12}$–$\frac{1}{8}$ in. *Corolla* reddish, 3 times the calyx. *Pod* 1 in. long or less, falcate or straight.

34. **HEDYSARUM,** Linn.

Herbs. *Leaves* numerous, odd-pinnate, exstipellate. *Flowers* usually red, in copious long-peduncled axillary racemes. *Calyx-tube* campanulate or tubular; teeth 5, distinct, long or short. *Corolla* much exserted; petals unequal in relative proportion in the different species; keel obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* linear, stalked, few-ovuled; style very long, filiform, abruptly inflexed, stigma minute terminal. *Pod* of 1–3 flattened indehiscent joints, in our species not muricated, but reticulately veined on the faces, the sutures usually furnished with acute entire or toothed borders.—DISTRIB. Species about 50, spread through the North Temperate zone.

* *Calyx-teeth equalling or exceeding the tube.*

10179 1. **H. kumaonense,** *Benth. MSS.*; stemless, leaflets small subcoriaceous obovate-oblong, bracts lanceolate, joints small firm turgid, sutures not bordered.

KUMAON, temperate region, alt. 9000 ft., *Strachey and Winterbottom.*

Leaves and peduncles in a dense rosette from a thick woody rhizome. *Leaf*-rachises 4–6 in. long, including distinct petiole; leaflets 17–25, $\frac{1}{4}$–$\frac{3}{8}$ in. long, obtuse, with a mucro, dark green, glabrous above, pale grey with adpressed silky hairs below; veins distinct. *Inflorescence* seen only in a late stage; pedicels very short. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in.; teeth setaceous, from a lanceolate base, exceeding tube. *Corolla* $\frac{5}{8}$–$\frac{3}{4}$ in. *Joints* of pod solitary in the specimens seen, rather downy, oblong, under $\frac{1}{4}$ in. long.

2. **H. sikkimense,** *Benth. MSS.*; stem dwarf, leaflets small linear-oblong subcoriaceous, standard and wings shorter than the keel, joints large membranous with toothed borders.

SIKKIM, alpine region, alt. 12–16,000 ft., *Hook. fil.*

Stems slender, at first slightly downy, $\frac{1}{2}$ ft. or less high. *Leaf*-rachis 2–3 in. long; leaflets 21–27, $\frac{1}{4}$–$\frac{1}{2}$ in. long, obtuse, glabrous above, obscurely pubescent with raised veins below. *Heads* dense, 1–2 in. long in flower; bracts linear, minute. *Calyx* pubescent, $\frac{1}{6}$–$\frac{1}{5}$ in.; teeth lanceolate, as long as the tube. *Corolla* bright red, $\frac{1}{2}$–$\frac{5}{8}$ in. *Joints* of pod 1–3, roundish or oblong, $\frac{1}{4}$–$\frac{3}{8}$ in. long; sutures irregularly faintly eroso-dentate.

3. **H. Falconeri,** *Baker*; caulescent, robust, leaflets large subcoriaceous ovate-oblong, keel and standard equal, joints large membranous with toothed borders.

WEST TIBET, temperate region, *Dr. Falconer.*

Stems $1\frac{1}{2}$–2 ft. high, slender, firm, sulcate, glabrous. *Leaf*-rachises 6–9 in. long; leaflets 13–19, distant, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, obtuse, glabrous, full green above, grey-green, obscurely canescent with prominent veins below. *Flower*-racemes 3–4 in. long, moderately close; bracts setaceous, very small; pedicel as long as the calyx. *Calyx* $\frac{1}{6}$ in. long; teeth setaceous, as long as the tube. *Corolla* $\frac{5}{8}$–$\frac{3}{4}$ in. *Joints* oblong, glabrous, $\frac{1}{2}$ in. long, thin, with broad irregularly eroso-dentate borders.

4. **H. astragaloides,** *Benth. MSS.*; caulescent, robust, leaflets large membranous linear-oblong, corolla yellowish, keel exceeding the standard, joints large membranous with crisped borders.

KISHTWAR, alpine zone, alt. 11–12,000 ft., *Thomson.* LAHUL, *Jaeschke.*

Stems robust, erect, 2 ft. high, densely canescent at first. *Leaf*-rachises 4–8 in. long; leaflets 21–29, not at all coriaceous, obtuse, with a minute mucro, $\frac{3}{4}$–1 in. long, glabrescent above, persistently grey-canescent below. *Flower*-racemes very dense, 2–3 in. long, the linear scariose bracts protruding beyond the buds; pedicels shorter than calyx. *Calyx* $\frac{1}{4}$ in., finely silky; teeth exceeding the tube. *Pod* distinctly stalked; joints 1–2, oblong, with a distinct rather crisped wing on the lower side and an obscure one on the upper.

5. **H. cachemirianum,** *Benth. MSS.*; caulescent, robust, leaflets large membranous linear-oblong, corolla red, standard exceeding wings and keel, joints large membranous with entire borders.

KASHMIR, temperate region, alt. 9–10,000 ft., *Thomson, Falconer, Winterbottom.*

Stem $1\frac{1}{2}$–2 ft. high, erect, glabrous, many-grooved. *Leaf*-rachises $\frac{1}{2}$–1 ft. long; leaflets 21–27, thin, obtuse, $\frac{3}{4}$–$1\frac{1}{4}$ in. long; both sides green, glabrescent, concolorous. *Racemes* very dense, 2–3 in. long in flower, the linear setaceous bracts protruding beyond the buds; pedicels very short. *Calyx* downy, $\frac{3}{8}$ in.; teeth as long as the tube. *Corolla* $\frac{3}{4}$–1 in. long. *Joints* 1–3, glabrous, oblong, $\frac{1}{2}$–$\frac{3}{4}$ in. long; both sutures with a distinct entire wing.

** *Calyx-teeth shorter than the tube.*

6. **H. laxiflorum,** *Benth. MSS.*; stems slender, leaflets subcoriaceous, bracts minute setaceous, keel exceeding wings and standard, joints small entire not bordered.

WEST HIMALAYA, temperate or alpine region. WEST TIBET, *Falconer.* Valley of Kishengunga, *Winterbottom.*

Stems $1\frac{1}{2}$–2 ft. high, firm, slender, glabrous. *Leaf*-rachis 3–5 in. long; leaflets 21–31, close, firm, linear-oblong, $\frac{1}{2}$–$\frac{5}{8}$ in. long, green, glabrous above, grey, obscurely canescent with raised veins below. *Racemes* lax, 2–3 in. long in flower; pedicels as long as the calyx, finely downy. *Calyx* $\frac{1}{6}$ in.; upper teeth deltoid, lower lanceolate. *Corolla* $\frac{5}{8}$–$\frac{3}{4}$ in. *Joints* 3–4, oblong, firm, glabrous, rather turgid, not more than $\frac{1}{6}$ in. long.

7. **H. strobiliferum,** *Baker*; stems robust, leaflets membranous, bracts large ovate-acuminate, corolla under twice the calyx, its petals equal.

KASHMIR, temperate region, *Falconer*.

Stems above a foot high, densely clothed with short adpressed whitish hairs. *Leaf*-rachises 6–8 in. long; leaflets 19–25, oblong-lanceolate, obtuse, 1–1½ in. long, flexible, glabrescent above, thinly white-silky beneath. *Racemes* dense, 2–3 in. long; the buds quite hidden by the imbricated scariose ciliated bracts; pedicels very short. *Calyx* tubular, ⅕–¼ in. long; teeth deltoid-cuspidate, not more than ¼–⅙ tube. *Corolla* yellowish, under ½ in. long. *Pod* unknown.

8. **H. microcalyx,** *Baker*; stems robust, leaflets large membranous, bracts linear minute, corolla several times calyx, keel exceeding standard, joints large membranous entire.

WEST HIMALAYAS, temperate region; GURWHAL, *Falconer*; KASHMIR, *Lance*; LAHUL, *Jaeschke*.

Stems 1½–2 ft. high, stout, sulcate, glabrous. *Leaf*-rachises 6–9 in. long; leaflets 11–13, distant, oblong-lanceolate, obtuse or subacute, 1–1½ in. long; both sides green, glabrous. *Flower*-racemes 2–4 in. long, lax; pedicels ⅛–¼ in. long, grey-pubescent. *Calyx* ⅛ in., campanulate, membranous, glabrous; teeth minute, deltoid-cuspidate. *Corolla* bright red, ⅝–¾ in. *Joints* 2–3, oblong, ½–⅝ in. long, thin, glabrous, the sutures both distinctly margined.

35. STRACHEYA, Benth.

A tufted low shrub. *Leaves* odd-pinnate. *Flowers* axillary. *Calyx-tube* turbinate; teeth 5, lanceolate, as long as the tube. *Corolla* much exserted; standard broad; keel as long as the other petals, incurved and obtuse at the tip. *Stamens* diadelphous; anthers uniform. *Ovary* linear, sessile, few-ovuled; style long, filiform, abruptly incurved, stigma minute capitate. *Pod* flat, not visibly jointed, muricated along the edge and face and marked with conspicuous transverse veins.—DISTRIB. A single endemic species.

1. **S. tibetica,** *Benth. in Hook. Kew Journ.* v. 306; *Walp. Ann.* iv. 545.

TIBETAN Himalayas, alpine region, from Pangong eastward to East Nipal, alt. 14–17,000 ft., *Thomson, Strachey & Winterbottom, &c.*

Stems densely tufted, from a slender woody rootstock, the leaves and peduncles in a rosette at the surface. *Leaves* odd-pinnate; leaflets 11–15, oblong, obtuse, faintly hairy; leaf-rachis 2–4 in. long, including a distinct petiole, articulated at the nodes. *Flowers* 1–5, shortly pedicellate, on very short peduncles; bracts lanceolate, silky. *Calyx* ¼ in., densely pubescent. *Corolla* ⅝–¾ in., reddish, glabrous. *Pod* glabrous, membranous, 1 in. long.

36. ZORNIA, Gmel.

Annuals, with large geminate coriaceous bracts and dotted leaflets in 1–2 opposite pairs. *Flowers* in lax racemes. *Calyx* minute; upper teeth short, connate; lowest shorter than the two middle ones. *Corolla* much exserted; standard broad; keel incurved, acute. *Stamens* monadelphous; anthers dimorphous. *Ovary* sessile, many-ovuled; style filiform, incurved, stigma minute capitate. *Pod* of several small round flattened finely muricated 1-seeded indehiscent joints.—DISTRIB. Species 10, all but two American.

1. **Z. diphylla,** *Pers.*; *Benth. in Mart. Fl. Bras.* xv. 80, t. 21–2. Hedysarum diphyllum, *Linn.*; *Roxb. Fl. Ind.* iii. 353. Z. angustifolia, *Smith*; *DC. Prodr.* ii. 316; *Wall. Cat.* 5660; *W. & A. Prodr.* 217; *Dalz. & Gibs. Bomb. Fl.* 62. Z. dictyocarpa, *DC. Prodr.* ii. 317. Z. gibbosa and graminea, *Spanoghe in Linnæa*, xv. 192.—*Rheede Hort. Mal.* ix. t. 82–3.

Plains from the HIMALAYAS to CEYLON and BIRMA, ascending to 4000 ft. in KUMAON.—DISTRIB. Everywhere in the Tropics.

Stems wiry, densely cæspitose. *Leaves* petioled; leaflets lanceolate, acute, glabrous, rigidly coriaceous, $\frac{1}{2}$–1 in. long, dotted with black glands; stipules lanceolate, with a long spur. *Racemes* 1–3 in. long, 3–12-flowered; bracts ovate, acute, nearly or quite hiding the flower and pod. *Joints* 2–6, under $\frac{1}{12}$ in., densely prickly.

VAR. 1. *zeylonensis*; leaflets ovate, pod much longer than the bracts, joints twice as large densely bristly. Z. zeylonensis, *Pers.*; *DC. Prodr.* ii. 317; *Wall. Cat.* 5661; *W. & A. Prodr.* 217; *Dalz. & Gibs. Bomb. Fl.* 62. Z. conjugata, *Smith in Rees, Cyclop.*; *Thwaites Enum.* 85. Hedysarum conjugatum, *Willd. Sp. Pl.* iii. 1178. Plains of the Western Peninsula and Ceylon.

VAR. 2. *Walkeri* (*Arn. Pugill.* 12, sp.); leaflets oblong $\frac{1}{4}$–1 in. long, bracts downy at the edge, pod scarcely exserted from the bracts, joints small reticulato-venose with only a few small bristles near the edge. *Walp. Rep.* i. 726; *Thwaites Enum.* 85.—Ceylon, *Walker, Thwaites.*

37. STYLOSANTHES, Sw.

Undershrubs. *Leaves* rigid, pinnately 3-foliolate. *Flowers* inconspicuous, in small dense heads. *Calyx* with an elongated filiform tube, and 5 teeth, of which the upper 4 are subconnate. *Flowers* polygamous, the fertile ones often apetalous. *Petals* inserted at the throat of the calyx-tube; standard orbicular; keel subrostrate. *Stamens* monadelphous; anthers dimorphous. *Ovary* subsessile at the base of the calyx-tube; style long, filiform, the lower part persistent, stigma minute capitate. *Pod* with 1–2 flattened rugose joints.—DISTRIB. Species about 15. Cosmopolitan, tropical.

1. **S. mucronata,** *Willd.*; *DC. Prodr.* ii. 318; *Wall. Cat.* 5664; *W. & A. Prodr.* 218; *Bedd. Ic. Pl. Ind. Or.* t. 294. Arachis fruticosa, *Retz.*; *Roxb. Hort. Beng.* 54; *Fl. Ind.* iii. 282. Hedysarum hamatum, *Burm. Fl. Ind.* 167; *Fl. Zeyl.* t. 106, fig. 2.

Shores of WESTERN PENINSULA and CEYLON.—DISTRIB. Cape, Trop. Africa, Malay isles.

A low diffuse undershrub, with terete pubescent branches. *Stipules* scariose, adnate downwards to the petiole; leaflets $\frac{1}{4}$–$\frac{1}{2}$ in. long, pale green, rigidly coriaceous, oblong or lanceolate; under-side a little pubescent at first. *Flowers* 1 or few, in sessile terminal heads; bracts persistent, striated, pubescent. *Corolla* $\frac{1}{8}$ in., exserted. *Pod* 1–2-jointed, tipped with the falcate indurated lower part of the style.

38. SMITHIA, Ait.

Herbs or undershrubs. *Leaflets* many, small, sensitive, leaf-rachis ending in a bristle; stipules scariose, with large auricles. *Flowers* racemose or axillary. *Calyx* deeply 2-lipped, the lips usually entire. *Corolla* exserted; standard orbicular; keel incurved, obtuse. *Stamens* in two bundles of 5 each; anthers uniform. *Ovary* linear, many-ovuled; style incurved, filiform, stigma minute capitate. *Pod* of few or many minute flattened or turgid joints, folded together inside the calyx.—DISTRIB. Species 20–30, spread through the tropics of the old world.

* *Calyx rigid, its veins close, parallel, simple.*

1. **S. sensitiva,** *Ait.*; *DC. Prodr.* ii. 323; stems not bristly, leaflets small 4–20, flowers in short simple racemes, calyx-lips equal, corolla yellow. *Roxb. Hort. Beng.* 56; *Fl. Ind.* iii. 342; *Salisb. Par.* t. 92; *Wall. Cat.* 5668, *ex*

parte; *W. & A. Prodr.* 220, *ex parte*; *Dalz. & Gibs. Bomb. Fl.* 63. S. abyssinica, *Hochst. in Schimp. Pl. Abyss.* 1838.

HIMALAYAS to TRAVANCORE and RANGOON, ascending to 3000 ft. in KHASIA.—DISTRIB. Madagascar, Abyssinia, Java, China.

Annual, ½–3 ft. high. *Stems* very slender, much branched. *Leaf*-rachis bristly, ½–1 in. long; leaflets ¼–½ in. long, with subparallel edges, bristly mainly on the midrib below. *Flowers* 1–6, in close short-peduncled racemes from the axils of the upper leaves; pedicels short, ascending. *Calyx* ¼–⅓ in. long; lips acute, entire, with a few short deciduous scattered bristles. *Joints* 4–6, densely papillose on the faces.

2. **S. geminiflora,** *Roth; DC. Prodr.* ii. 323; stems not bristly, leaflets small 4–12, flowers in pairs in the axils of the leaves, calyx-lips equal, corolla yellow. S. sensitiva, *Wall. et W. & A. loc. cit. ex parte.*

HIMALAYAS (ascending to 1–3000 ft.) to CEYLON and TAVOY.—DISTRIB. Java, N. Australia.

General habit of the last. *Leaflets* obtuse, with parallel sides, ¼–⅜ in. long, the bristles of the edge and midrib more copious and longer. *Calyx* ¼ in., with a few deciduous bristles; both lips entire, acute. *Corolla* about twice the calyx. *Joints* 4–6, very turgid and papillose.

VAR. 1. *conferta*; upper nodes congested into dense heads, leaves and calyx more bristly. S. conferta, *Sm.*; *DC. loc. cit.* S. capitata, *Desv. Journ. Bot.* i. 121, *non Dalz.* S. hispidissima, *Zolling. Geneesk. Arch.* iii. 56.

3. **S. purpurea,** *Hook. Bot. Mag.* t. 4283; stems not bristly, leaflets small 12–24, flowers in sublax peduncled axillary racemes, lower calyx-lip shorter, corolla purple. S. laxiflora, *Benth. Pl. Jungh.* 211.

Plains of CONCAN.

Annual. *Stems* very slender, ½–2 ft. high. *Leaf*-rachis 1–2 in. long; leaflets linear, ¼–⅝ in. long, tipped with a long awn and furnished with a few bristles on the rachis and oblique midrib. *Flowers* 6–12, in copious short-peduncled secund racemes from the axils of the upper leaves; pedicels cernuous; bracteoles acute or obtuse, ⅓–¼ calyx. *Calyx* ¼–⅜ in. long; upper lip obtuse, recurved, lower subacute, both without bristles. *Corolla* little exserted. *Joints* of pod 10–12, reticulato-venose, not papillose.

4. **S. setulosa,** *Dalz. in Kew Journ.* iii. 208; stems densely bristly, leaflets large 10–12, flowers in copiously panicled secund racemes, lower calyx-lip shorter, corolla yellow. *Dalz. & Gibs. Bomb. Flora,* 63; *Bedd. Ic. Pl. Ind. Or.* t. 243.

Plains of CONCAN, *Stocks, Dalzell.*

A robust annual, 2–4 ft. high, the stems densely clothed throughout with deflexed bristles. *Leaflets* linear, ¾–1½ in. long, with a few bristles in the edge and subcentric midrib. *Racemes* 1–2 in. long, dichotomously forked, forming a long thyrsoid panicle, only the lowest subtended by a leaf; pedicels ascending. *Calyx* ⅜ in. long, densely clothed with minute bristles; upper lip broad, obtuse, recurved; lower much smaller, lanceolate, acute. *Corolla* twice the calyx. *Joints* 10–12, reticulato-venose, not papillose.

** *Calyx membranous, its veins not so close and distinctly anastomosing.*

5. **S. bigemina,** *Dalz. in Kew Journ.* iii. 208; stems minutely bristly, leaflets 4, flowers in short axillary racemes, bracteoles minute, joints 6–8 echinulate. *Dalz. & Gibs. Bomb. Flora,* 64.

Plains of CONCAN, *Stocks, Dalzell*; DEKKAN, near Poonah, *Jacquemont.*

Annual, very diffuse, with very slender stems, 1 ft. or less high. *Leaf*-rachis ⅛ in. long; leaflets membranous, oblanceolate-oblong, obtuse, ⅜–½ in. long, minutely bristly

on the back and edge. *Flowers* 4–6, in copious short-peduncled racemes; bracteoles linear, $\frac{1}{3}$ the calyx. *Calyx* $\frac{1}{8}$ in., turbinate, densely bristle-ciliated; lips equal, upper truncate. *Corolla* yellow, twice the calyx.

6. **S. gracilis,** *Benth. in Hohen. Pl. Ind. Or. Exsic.* No. 1182; stems naked or minutely bristly, leaflets 4–6, flowers in short axillary racemes, bracteoles minute, joints 6–8 reticulato-venose. *Benth. Pl. Jungh.* 212.

NILGHIRIS, *Schmidt, Wight.*

A diffuse, very slender, perennial, with the general habit and inflorescence of *S. bigemina*. *Leaflets* obovate-oblong, $\frac{1}{4}$–$\frac{3}{8}$ in., minutely bristly. *Calyx* $\frac{1}{8}$ in., densely ciliated with minute bristles; lips equal, narrower than in the last, the lower acute; bracteoles linear. *Corolla* bright yellow, twice the calyx. *Joints* distinctly veined, not at all echinulate as in *S. bigemina.*

7. **S. ciliata,** *Royle Ill.* 201 t. 35, fig. 2; stems not bristly, leaflets 6–16, flowers in dense axillary racemes, bracteoles large, joints 6–8 obscurely papillose. S. pumila, *Royle MSS.; W. & A. Prodr.* 220.

SIMLA and KUMAON to KHASIA and SIKKIM, alt. 3–6000 ft. Parasnath in BEHAR.

Annual. *Stems* slender, $\frac{1}{2}$–2 ft. high. *Leaf*-rachis $\frac{1}{2}$–1 in.; leaflets linear, $\frac{1}{4}$–$\frac{3}{8}$ in. long, obtuse, distinctly bristly on the edge and midrib below. *Flowers* up to a dozen in dense copious short-peduncled secund racemes; bracteoles leafy, oblong, ciliated, nearly as long as calyx. *Calyx* $\frac{1}{4}$ in., densely bristly-ciliated; upper lip truncate, finally $\frac{1}{4}$ in. broad; lower lanceolate. *Corolla* yellow, little exserted.

8. **S. capitata,** *Dalz. in Kew Journ.* iii. 208; stems not bristly, leaflets 20–30, flowers in globose terminal heads, bracteoles large, joints 5–6 smooth. *Dalz. & Gibs. Bomb. Flora,* 63, *non Desv.*; *Bedd. Ic. Pl. Ind. Or.* t. 244.

WESTERN PENINSULA.

An annual, 1–2 ft. high, with firm shrubby terete branches. *Leaf*-rachis densely bristly, $1\frac{1}{2}$–2 in. long; leaflets linear, $\frac{1}{4}$–$\frac{3}{8}$ in. long, bristly on the back and edge. *Flowers* in a dense globose head 1 in. thick, at the end of each branch; pedicels very short; bracteoles oblong, membranous, bristle-tipped, nearly as long as the calyx. *Calyx* $\frac{3}{8}$ in. long; both lips broad, truncated, ciliated with long bristles. *Corolla* purplish, much exserted. *Joints* neither venose, nor papillose.

9. **S. pycnantha,** *Benth. MSS.*; stems minutely bristly, leaflets 6–8, flowers in globose terminal heads, bracteoles minute, joints 5–6 venose.

CONCAN, *Stocks, Law.*

An erect annual, $\frac{1}{2}$–2 ft. high, the stem clothed densely with small bristles dilated at the base. *Leaves* distinctly petioled; leaf-rachis $\frac{1}{2}$ in. or less long, densely bristly; leaflets linear, $\frac{3}{8}$–$\frac{5}{8}$ in. long, with a few minute yellow bristles in the back and edge. *Heads* 1 in. or more broad, formed of densely congested racemes; pedicels shorter than the calyx; bracteoles half the calyx, obtuse. *Calyx* $\frac{1}{8}$ in., with copious sessile black glands and small yellow bristles on back and edge; lips equal, truncate. *Corolla* yellow, half as long again as calyx.

10. **S. dichotoma,** *Dalzell MSS.*; stems not bristly, leaflets 4–6, racemes forming a lax corymbose panicle, bracteoles minute, joints 10–12 papillose. S. blanda, *Hohen. Plant. Ind. Or. Exsic.* No. 146, *non Wall.*

WESTERN PENINSULA.

Stems annual, very slender, little branched, 1–$1\frac{1}{2}$ ft. high. *Leaf*-rachis $\frac{1}{2}$ in. or less long; leaflets membranous, oblanceolate-oblong, obtuse, $\frac{1}{2}$–$\frac{5}{8}$ in. long, not aristate, both sides without bristles. Lower *racemes* of the panicles 5–6-flowered, secund; pedicels ascending, $\frac{1}{8}$–$\frac{1}{4}$ in.; bracteoles linear, $\frac{1}{3}$–$\frac{1}{4}$ calyx. *Calyx* membranous, $\frac{3}{8}$ in.; lower acute lip slightly longer than the broad truncate upper one. *Corolla* yellow, half as long again as the calyx.

11. **S. grandis,** *Benth. MSS.*; stems robust not bristly, leaflets 20–24, racemes forming a lax corymbose panicle, bracteoles $\frac{1}{4}$ calyx, joints 20–25 venose.

Base of the Himalayas in SIKKIM, *Herb. Griffith, Hook. fil.*.
Stems stout, erect, 3–4 ft. high. *Leaf*-rachis $2\frac{1}{2}$–3 in. long; leaflets linear, obtuse, without bristles, $\frac{1}{2}$–$\frac{5}{8}$ in. long; lower stipules 1 in. long. *Racemes* subsecund, 6–12-flowered, forming a corymbose panicle $\frac{1}{2}$ ft. broad; pedicels erect, $\frac{3}{8}$–$\frac{1}{2}$ in. long, with a few deciduous bristles; bracteoles $\frac{1}{4}$ in., obtuse. *Calyx* $\frac{3}{4}$ in. long; lips equal, truncate, obtuse, with only a few small bristles at first. *Joints* largest of all, $\frac{1}{6}$ in. broad.

12. **S. blanda,** *Wall. Cat.* 5669; stems densely bristly, leaflets 6–10, racemes copiously panicled, bracteoles half as long as the calyx, joints 5–6 reticulated. *W. & A. Prodr.* 221; *Wight. Ic.* t. 986; *Dalz. & Gibs. Bomb. Fl.* 64.

EAST HIMALAYAS, tropical zone up to 4000 feet, EAST BENGAL, NILGHIRIS.
Perennial, suffruticose. *Stems* $1\frac{1}{2}$–2 ft. high, the bristles very dense, spreading, fine, fragile. *Leaf*-rachis under 1 in. long; leaflets firm, obtuse, bristle-tipped, $\frac{1}{2}$–$\frac{5}{8}$ in. long, with copious fine deciduous bristles on the rachis, edge and midrib. *Racemes* forming a dense terminal panicle, with corymbose branches; pedicels $\frac{1}{12}$–$\frac{1}{6}$ in., densely bristly. *Calyx* $\frac{1}{6}$–$\frac{1}{4}$ in., densely clothed with fine bristles on back and edge; lips equal; upper broad, truncate. *Corolla* bright yellow, twice the calyx. *Joints* $\frac{1}{12}$ in. broad.

VAR. 1. *paniculata*; stems more slender, flowers fewer smaller crowded at the end of the peduncles. S. paniculata, *Arn. Pug.* 12.—Hilly tracts of Ceylon, alt. 2–7000 ft.

VAR. 2. *racemosa*; annual, more slender and fugacious, leaflets more membranous, calyx $\frac{1}{8}$–$\frac{1}{6}$ in. long, corymbs formed of a few close subsecund racemes 1–$1\frac{1}{2}$ in. long. S. racemosa, *Heyne in Wall. Cat.* 5670; *W. & A. Prodr.* 221; *Dalz. & Gibs. Bomb. Fl.* 63. S. hirsuta, *Dalz. in Kew Journ.* iii. 135; *Dalz. & Gibs. Bomb. Fl.* 63.—Plains of Western Peninsula and Ceylon.

39. ÆSCHYNOMENE, Linn.

Erect herbs or undershrubs. *Leaves* with very numerous close sensitive odd-pinnate small linear leaflets. *Flowers* in sparse racemes. *Calyx* deeply 2-lipped, the lips faintly toothed. *Corolla* fugacious; standard orbicular; keel not beaked. *Stamens* in two bundles of 5 each; anthers uniform. *Ovary* stalked, linear, many-ovuled; style filiform, incurved, stigma terminal. *Pod* linear, with a stalk longer than the calyx and 4–8 flattened 1-seeded separating joints.—DISTRIB. Species about 30, spread everywhere in the tropics.

1. **Æ. indica,** *Linn.*; *DC. Prodr.* ii. 320; stems slender much branched, peduncles viscid, calyx and small corolla glabrous. *W. & A. Prodr.* 219; *Wt. Ic.* t. 405; *Dalz. & Gibs. Bomb. Fl.* 62. Æ. aspera, *Wall. Cat.* 5666, *non Linn.* Æ. kashmiriana, *Camb. in Jacquem. Voy. Bot.* 40, t. 48. Hedysarum Neli-Tali, *Roxb. Hort Beng.* 57; *Fl. Ind.* iii. 365. Æ. pumila, *Linn.*; *DC. Prodr.* ii. 321. Æ. diffusa, *Willd.*; *DC. Prodr. loc. cit.*; *Wall. Cat.* 5665. Æ. viscidula, *Willd. Enum.* 776. Æ. Roxburghii, *Spreng. Syst.* iii. 322. Smithia aspera, *Roxb.*, *Hort. Beng.* 56; *Fl. Ind.* iii. 343—*Rheede Hort. Mal.* ix. t. 18.

HIMALAYAS to CEYLON and SIAM, ascending to 5000 ft. in KASHMIR and 4000 ft. in KUMAON.—DISTRIB. Japan and everywhere in tropics of old world.
A suffruticose annual, 1–3 ft. high, glabrous, pale green, with slender terete branches. *Leaf-rachis* 2–3 in. long; leaflets close, 41–61, linear, obtuse, 1-nerved; stipules lanceolate, membranous, deciduous, with a large auricle. *Flowers* 1–4, in copious axillary racemes; peduncle and pedicels usually viscid; bracts small, lanceolate,

rigid, gland-ciliated. *Calyx* under $\frac{1}{4}$ in. long. *Corolla* fugacious, twice the calyx. *Pod* 1–1$\frac{1}{2}$ in. long, straight or rather curved; upper suture straight, lower more or less distinctly indented; joints 6–10, $\frac{1}{8}$–$\frac{1}{6}$ in. broad, smooth or finally papillose on the face.

2. **Æ. aspera,** *Linn.*; *DC. Prodr.* ii. 320; stems robust simple or little-branched, peduncles calyx and large corolla hispid. *W. & A. Prodr.* 219; *Wt. Ic.* t. 299. Æ. indica, *Wall. Cat.* 5667, *non Linn.* Hedysarum lagenarium, *Roxb. Hort. Beng.* 57; *Fl. Ind.* iii. 365. Æ. indica, β aspera, *Hassk. Pl. Jav. Rar.* 340. Æ. trachyloba, *Miq. Flor. Ind. Bat.* i. 276.

Tropical Zone; BENGAL and SILHET to MALACCA and CEYLON.—DISTRIB. Malay isles, Tropical Africa.

A tall erect swamp species, with stout glabrous main stems, full of white pith. *Stipules* linear or lanceolate, auricled, deciduous; leaf-rachis 3–6 in. long; leaflets 61–101, linear, obtuse, 1-nerved. *Racemes* corymbose, 2–4-flowered; pedicels and peduncles clothed with spreading bristles. *Calyx* $\frac{3}{8}$ in., with a pair of round bracteoles. *Corolla* twice the calyx. *Pod* 2–2$\frac{1}{4}$ in. by $\frac{1}{3}$ in.; joints 3–6, smooth or echinate on the faces over the seeds.

Æ. SURATTENSIS, *W. & A. Prodr.* 219, is altogether doubtful, the description being probably taken in part from *Sesbania aculeata.*

40. ORMOCARPUM, Beauv.

Shrubs. *Leaves* with odd-pinnate exstipellate leaflets and persistent striated stipules and bracts. *Flowers* in lax racemes. *Calyx*-tube campanulate; 2 upper teeth deltoid; 3 lower lanceolate. *Standard* broad; keel much incurved, not at all beaked. *Stamens* in two bundles of 5 each; anthers uniform. *Ovary* linear, few-ovuled; style filiform, inflexed, stigma minute terminal. *Pod* of a few indehiscent turgid linear or oblong joints, the lower seedless, the faces rugose, naked or muricated with weak gland-tipped prickles.—DISTRIB. Species 6, spread all round the world in the tropics.

1. **O. sennoides,** *DC. Prodr.* ii. 315; *Wall. Cat.* 5658; *W. & A. Prodr.* 216; *Wt. Ic.* t. 297. O. coronilloides, *G. Don Gen. Syst.* ii. 279. Hedysarum sennoides, *Willd.*; *Roxb. Hort. Beng.* 57; *Fl. Ind.* iii. 364.

Plains of the WESTERN PENINSULA and CEYLON.—DISTRIB. Siam, Philippines, Polynesia, Trop. Africa.

A low shrub, with terete slender branches, the branchlets and leaf-rachis viscid. *Leaflets* 9–17, alternate, oblong, obtuse, membranous, deciduous. *Flowers* 2–6, in copious short-peduncled axillary corymbose racemes; bracts spreading, minute, deltoid; pedicels viscid, as long as calyx. *Calyx* $\frac{1}{4}$ in. *Corolla* yellow, much exserted. *Pod* with 2–4 joints, linear or oblong, $\frac{1}{2}$–1 in. long, horizontally plicate, smooth or muricated.

41. LEPTODESMIA, Benth.

Diffuse perennial herbs. *Leaves* simple or pinnately 3-foliolate, stipellate. *Bracts* large, imbricated. *Flowers* small, crowded in dense terminal racemose heads. *Calyx* with a very short tube, and 5 subequal setaceous teeth. *Corolla* minute, included; standard broad; keel obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, 1-ovuled; style long, filiform, incurved, stigma capitate. *Pod* small, oblong, membranous, flattened, 1-seeded, opening widely along the ventral suture.—DISTRIB. Two species, the other a plant of Madagascar.

1. **L. congesta,** *Benth. MSS.* Nicolsonia congesta, *Wight Ic.* t. 1056. Desmodium congestum, *Benth. Pl. Jungh.* 222, *non W. & A.*

Tropical Zone; NILGHIRIS, *Gardner*, *Schmidt*, *Wight*.

A perennial, with slender firm trailing cæspitose stems 1–2 ft. long. *Leaves* short-petioled, membranous, 1 or 3-foliolate, the end leaflet the largest, orbicular or oblong, obtuse, ¼–¾ in. long, a little hairy below. *Flowers* in copious oblong terminal capitate racemes under 1 in. long; bracts ovate, scariose, finely pubescent; pedicels short. *Calyx* ¼ in; teeth densely plumose. *Pod* as long as calyx.

42. ELEIOTIS, DC.

An annual herb. *Leaves* usually 1-foliolate. *Flowers* in axillary racemes. *Calyx* with a very short tube and 5 subequal setaceous teeth. *Corolla* minute; standard broad; keel obtuse, adhering to the wings. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, 1-ovuled; style short, uncinate or nearly straight, thickened at the base, stigma capitate. *Pod* of a single dimidiate membranous veined joint, with a flattened straight dorsal and rounded ventral suture.—A single endemic species.

1. **E. sororia,** *DC. Prodr.* ii. 348; *Wall. Cat.* 5741; *W. & A. Prodr.* 231. E. monophylla, *DC. loc. cit.* Hedysarum sororium, *Linn.*; *Roxb. Fl. Ind.* iii. 352. Hallia sororia, *Willd. Sp.* iii. 1170. Glycine monophylla, *Burm. Fl. Ind.* 161, t. 50, fig. 2.

Plains of BUNDELKUND, WESTERN PENINSULA and CEYLON.

An annual, with slender trailing densely cæspitose glabrous stems, 1–2 ft. long. *Leaves* subglabrous, membranous, consisting usually of a single short stalked stipellate terminal leaflet, rounded or broader than long, emarginate, ¼–1 in. long, but occasionally with a pair of minute lateral leaflets. *Flowers* in copious simple lax axillary racemes; pedicels spreading, downy, exceeding the calyx; bracts minute, ovate, scariose, deciduous. *Pod* ¼ in. long.

43. PYCNOSPORA, R. Br.

A low shrub. *Leaves* pinnately 3-foliolate. *Flowers* minute, racemed, *Calyx* deeply cleft, the upper teeth subconnate. *Corolla* much exserted; standard roundish; keel obtuse, cohering to the wings. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, many-ovuled; style inflexed, filiform; stigma minute capitate. *Pod* oblong, turgid, 2-valved, 8–10-seeded, continuous within, not jointed, but marked with transverse veins.—A single species, combining the habit of *Desmodium*, with a pod like *Crotalaria*.

1. **P. hedysaroides,** *R. Br. in Herb. Banks.* P. nervosa, *W. & A. Prodr.* 197; *Dalz. & Gibs. Bomb. Fl.* 75. Crotalaria? nervosa, *Grah. in Wall. Cat.* 5428. Indigofera desmodioides, *Benth. in Hohen. Pl. Ind. Or.* No. 303.

Tropical zone; KHASIA (3–5000 ft.), SILHET, TENASSERIM, WESTERN PENINSULA, CEYLON.—DISTRIB. China. Philippines, N. Australia.

A perennial herb, with slender densely cæspitose trailing stems ½–2 ft. long. *Leaves* pinnately 3-foliolate; leaflets obovate, obtuse, ¼–1½ in. long, stipellate, subcoriaceous, glabrous above, finely downy and reticulato-venose below. *Flowers* in lax terminal racemes; bracts deciduous, scariose, ovate-cuspidate; pedicels downy, 2–3 times the calyx. *Calyx* $\frac{1}{12}$ in. long or less. *Pod* ⅜–½ in. long, finally black.

44. PSEUDARTHRIA, W. & A.

Habit of *Desmodium*, from which it only differs in pod. *Calyx*-teeth as long as the tube, 2 upper subconnate. *Corolla* 2–3 times the calyx; standard broad; keel obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, many-ovuled; style filiform, stigma capitate. *Pod* linear-oblong, compressed, mem-

branous, indehiscent, continuous within, the sutures not at all indented.—DISTRIB. Species 5, the others African.

1. **P. viscida,** *W. & A. Prodr.* 209; *Wight Ic.* t. 286. Hedysarum viscidum, *Linn.*; *Roxb. Hort. Beng.* 57; *Fl. Ind.* iii. 356. Desmodium viscidum, *DC. Prodr.* ii. 336; *Wall. Cat.* 5698. Rhynchosia viscida, *DC. Prodr.* ii. 387. Glycine viscida, *Willd. in Nova Acta*, iv. 208. Desmodium Leschenaultii, *DC. Prodr.* ii. 336?

Tropical zone, WESTERN PENINSULA and CEYLON, up to 3000 ft.—DISTRIB. Timor.

Perennial, 2–3 ft. high, with slender stems, clothed with fine grey pubescence. *Leaves* petioled; pinnately 3-foliolate; leaflets stipellate, membranous or subcoriaceous, green, obscurely bristly above, grey, densely pubescent, rarely subglabrescent below; end leaflet round-rhomboidal, obtuse or acute, 2–4 in. long. *Racemes* axillary and terminal, sometimes branched; flowers distant, fascicled; pedicels spreading, 3–4 times the minute calyx. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. long, 4–6-seeded, finely downy.

45. LOUREA, Neck.

Herbs. *Leaves* membranous, stipellate, 1–3-foliolate. *Flowers* in terminal simple or panicled racemes. *Calyx* membranous, accrescent, the lanceolate teeth as long as the campanulate tube. *Corolla* equalling or exceeding the calyx; standard broad; keel obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* few-ovuled; style filiform, inflexed, stigma capitate. *Pod* of about 4 small distinct 1-seeded smooth veined joints, included in the calyx.—All the species are East Indian.

1. **L. paniculata,** *Wall. Cat.* 5673; leaves 1-foliolate, nearly twice as broad as long, racemes copiously panicled. *Benth. Pl. Jungh.* 215.

AVA; Taong-dong mountains, *Wallich.*

Stems erect, slender, finely downy. *Leaves* 2½–3 in. broad, rigidly coriaceous, glabrous; lobes spreading, rounded at the point, 4–5-nerved, base subcordate, apex rounded or slightly emarginate; petiole nearly as long as the blade. *Racemes* 1–3, forming copious terminal and lateral panicles; pedicels pubescent, cernuous, sometimes geminate, shorter than the calyx. *Calyx* slightly downy, finally $\frac{1}{6}$–$\frac{1}{5}$ in. *Joints* downy.

2. **L. Vespertilionis,** *Desv.*; *DC. Prod.* ii. 323; leaflets 1 rarely 3 glabrous 4–6 times as broad as long, racemes simple or slightly panicled. *W. & A. Prodr.* 221; *Wight Ic.* t. 285; *Wall. Cat.* 5671. Hedysarum Vespertilionis, *Linn.*; *Roxb. Hort. Beng.* 57; *Fl. Ind.* iii. 352.

Common in waste places throughout India.—DISTRIB. Tropics of both hemispheres, often planted.

Stems erect, slender, finely downy upwards. *Petiole* $\frac{1}{2}$–1 in.; leaflets rigidly subcoriaceous, green, clouded usually with white, the end one 2–3 in. broad, $\frac{1}{4}$–$\frac{1}{2}$ in. long, with two linear or lanceolate spreading or slightly ascending 2–3-nerved halves; apex bristle-tipped, broadly emarginate; side leaflets, if present, much smaller, obliquely obversely deltoid. *Racemes* 3–6 in. long; pedicels pubescent, shorter than the calyx; lower geminate. *Calyx* finally $\frac{1}{4}$–$\frac{3}{8}$ in. long. *Corolla* not exserted. *Joints* 4–5.

3. **L. obcordata,** *Desv.*; *DC. Prodr.* ii. 324; leaflets 3 rarely 1 pilose beneath on the veins, terminal roundish or obversely deltoid, racemes usually simple. Hedysarum obcordatum, *Poir. Dict. Suppl.* ii. 425. H. reniforme, *Lour. Fl. Coch.* 447. L. reniformis, *DC. loc. cit.* L. microphylla, *Wall. Cat.* 5672. Desmodium præmorsum, *Grah. in Wall. Cat.* 5703.

BIRMA, *Wallich.*—DISTRIB. Malay isles, China, Philippines, N. Australia.

Stems cæspitose, very slender, wide-trailing, pubescent. *Petiole* $\frac{1}{2}$–$\frac{3}{4}$ in.; leaflets membranous, pale green, as broad as long, truncate or rounded at the apex, pale green, not clouded, glabrous above, $\frac{1}{4}$–$\frac{3}{4}$ in. long. *Racemes* very lax, reaching 6–9 in. long; pedicels as long as the calyx, pubescent, cernuous, rarely geminate. *Calyx* downy, finally $\frac{1}{5}$–$\frac{1}{4}$ in. long. *Corolla* twice the flowering-calyx. *Joints* 4–5, glabrous.

4. **L. campanulata,** *Benth. Pl. Jungh.* 215; leaflets 3 rarely 1 obovate-oblong downy beneath, racemes copiously panicled. Uraria campanulata, *Wall. Cat.* 5685.

AVA; Taong-dong mountains, *Wallich.*

Erect, with the habit of a *Desmodium. Stems* firm, slender, finely downy. *Petioles* $\frac{1}{4}$–$\frac{3}{4}$ in.; leaflets subcoriaceous, green, glabrous above, pale green, reticulato-venose below; end one 2–3 in. long, obtuse, with a cuneate base; side ones much smaller. *Racemes* 4–6 in. long, forming copious terminal panicles, with densely pubescent rachises; pedicels $\frac{1}{8}$ in., curved. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in., densely pubescent. *Corolla* twice flower-calyx. *Joints* 2–3, pubescent.

46. **URARIA,** Desv.

Suffruticose perennials. *Leaves* stipellate, with 1 to 9 leaflets. *Flowers* very numerous, minute, racemose. *Calyx-tube* very short; two upper teeth short; three lower usually elongated, setaceous. *Standard* broad; wings adhering to the obtuse keel. *Stamens* diadelphous; anthers uniform. *Ovary* sessile or short-stalked, few-ovuled; style inflexed filiform, stigma terminal. *Pod* of 2–6 small turgid 1-seeded indehiscent joints, often placed face to face.—DISTRIB. Species all here included.

* *Upper leaves* 5–9-*foliolate.*

1. **U. picta,** *Desv.*; *DC. Prodr.* ii. 324; leaflets linear clouded, pedicel clothed with short bristles. *Wall. Cat.* 5674; *W. & A. Prodr.* 221; *Dalz. & Gibs. Bomb. Fl.* 65. Doodia picta, *Roxb. Fl. Ind.* iii. 368. Hedysarum pictum, *Jacq. Ic.* t. 567; *Roxb. Hort. Beng.* 57. U. linearis, *Hassk. Pl. Jav. Rar.* 349.

HIMALAYAS to CEYLON, ascending to 6000 ft. in the north-west.—DISTRIB. Tropical Africa, Malay isles, Philippines.

An erect little-branched suffruticose perennial, 3–6 ft. high. *Stems* robust, finely downy. *Petioles* 1–2 in.; leaflets 4–6, rarely 9, rigidly subcoriaceous, glabrous above, reticulato-venulose, minutely pubescent below, 4–8 in. long, $\frac{1}{4}$–1 in. broad; lowest simple, round or oblong. *Flowers* in dense cylindrical racemes, $\frac{1}{2}$–1 ft. long, $\frac{5}{8}$–$\frac{3}{4}$ in. broad; bracts brown, scariose, deciduous, not distinctly ciliated; upper lanceolate, lower ovate acuminate; pedicels $\frac{1}{4}$–$\frac{3}{8}$ in., abruptly recurved at the tip after flowering. *Corolla* purple, slightly exserted. *Joints* 3–6, glabrescent, polished, often whitish.

2. **U. crinita,** *Desv.*; *DC. Prodr.* ii. 324; leaflets oblong not clouded, pedicels clothed with long bristles. *Wall. Cat.* 5675. U. picta, *Wight Ic.* t. 411, *non Desv.* U. comosa, *DC. Prodr.* ii. 324. Hedysarum crinitum, *Linn.*; *Burm. Fl. Ind.* 169, t. 56; *Roxb. Hort. Beng.* 57. Doodia crinita, *Roxb. Fl. Ind.* iii. 369.

HIMALAYAS to CEYLON and SIAM, ascending to 9000 ft. in the north-west.—DISTRIB. China, Malay isles.

General habit of the last. Upper *leaves* 3–7-foliolate; leaflets subcoriaceous, green, smooth above, paler, reticulato-venose beneath, 4–6 in. long, $1\frac{1}{2}$–2 in. broad, much rounded at the base. *Racemes* dense, reaching above a foot long, 1–$1\frac{1}{2}$ in. thick;

lower pedicels $\frac{1}{2}$–$\frac{5}{8}$ in. long with spreading bristles 3–4 times their thickness; bracts distinctly ciliated. *Calyx*-segments densely plumose. *Corolla* purplish, $\frac{1}{4}$ in. long. *Joints* 4–6, opaque.

** *Leaves* 1- *and* 3-*foliolate intermixed.*

3. **U. lagopoides,** *DC. Prodr.* ii. 324; stems trailing, leaflets small orbicular or oblong, heads short dense oblong-cylindrical, lower calyx-teeth elongated. *W. & A. Prodr.* 222, *non Wall.* Hedysarum lagopoides, *Burm. Fl. Ind.* 68, t. 53, fig. 2. U. retusa, *Wall. Cat.* 5680. Doodia lagopodioides, *Roxb. Fl. Ind.* iii. 366. Lespedeza lagopoides, *Pers. Ench.* ii. 308. U. hamosa, *Wall. Cat.* 5681, *A., non W. & A.*

Tropical zone. NIPAL and BENGAL to AVA.—DISTRIB. Malay isles, China, Polynesia, N. Australia.

Stems densely cæspitose, woody, slender, pubescent. *Petiole* $\frac{1}{2}$–1 in.; leaflets many, of both kinds, obtuse, broadly rounded at the base, 1–2 in. long, glabrous above, finely downy below. *Heads* always simple, very dense, 1–2, rarely 3 in. long, under 1 in. thick; bracts subpersistent, distinctly ciliated; pedicels densely crinite, not longer than calyx. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in.; lower teeth setaceous, densely plumose. *Corolla* scarcely exserted. *Joints* 1–2, brown, polished, finely pubescent. *U. cercifolia*, Desv.; DC. Prodr. ii. 325, is probably a form of this with a single leaflet.

4. **U. lagopus,** *DC. Prodr.* ii. 324; stems erect, leaflets large oblong not cordate, heads long dense cylindrical, lower calyx-teeth elongated. Hedysarum arboreum, *Don Prodr.* 243. Uraria arboreum, *G. Don Gen. Syst.* ii. 287. U. lagopodioides, *Wall. Cat.* 5676, *non DC.* U. alopecuroides, *Wight Ic.* t. 290. Doodia alopecuroides, *Roxb. Fl. Ind.* iii. 368. U. hamosa, *Wall. Cat.* 5681 *C.* Hedysarum alopecuroides, *Roxb. Hort. Beng.* 57.

PUNJAB, along the Himalayas to ASSAM and AVA, ascending to 6000 ft. in SIMLA.

An erect undershrub, reaching 10–12 ft., with slender woody densely pubescent branches. *Leaves* usually all 3-foliolate, subcoriaceous, glabrescent above, reticulato-venose, finely downy below; end leaflet 2–4 in. long, $1\frac{1}{2}$–2 in. broad. *Racemes* copious, both terminal and axillary, resembling those of *U. crinita*, reaching 6–9 in. by 1–$1\frac{1}{4}$ in.; bracts deciduous; pedicels 2–3 times the calyx, densely crinite. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in. *Corolla* purple, little exserted. *Joints* 2–6, dark or pale, dull or polished.

5. **U. repanda,** *Wall. Cat.* 5677; stems erect, leaflets large cordate-ovate, heads dense cylindrical, lower calyx-teeth elongated. *Benth. Pl. Jungh.* 213.

BIRMA, *Wallich.*

General habit of the last, to which it is closely allied. Pubescence of *branches* shorter. *Leaves* simple and trifoliolate intermixed, the side leaflets of the latter much smaller than the end one, which is subobtuse or subacute, deeply produced at the base. *Racemes* 2–4 in. by $\frac{5}{8}$–$\frac{3}{4}$ in.; bracts ovate, acuminate, distinctly ciliated, not deciduous; pedicels densely crinite, shorter than the calyx. *Calyx* $\frac{1}{4}$ in.; lower teeth long, setaceous, plumose. *Joints* 2, polished, glabrous, brownish-drab.

6. **U. hamosa,** *Wall. Cat.* 5681 *B*; stems erect, leaflets large oblong not cordate, racemes long lax cylindrical, lower calyx teeth not elongated. *W. & A. Prodr.* 222; *Wight Ic.* t. 284. Hedysarum hamosum, *Roxb. Hort. Beng.* 57. Doodia hamosa, *Roxb. Fl. Ind.* iii. 367. U. lanceolata and desmodioides, *Grah. in Wall. Cat.* 5682, 5683. U. leptostachya, *Wall. Cat.* 5684. Desmodium Horsfieldii and dasyphyllum, *Miq. Fl. Ind. Bat.* i. 251–3.

HIMALAYAS to CEYLON, BIRMAH and PEGU, ascending in SIKKIM to 4000 ft.—DISTRIB. Malay isles.

Branches woody, slender, shortly pubescent. *Leaves* similar in texture to those of all the preceding, sometimes all simple, the end one obtuse, broadly rounded at the

base, 3–5 in. by 2–3 in. *Racemes* much laxer than in the other species, resembling those of a *Desmodium*, copiously panicled, reaching ½–1 ft. long; bracts ovate, cuspidate, pubescent, deciduous; pedicels ⅛–⅙ in., often fascicled. *Calyx* ⅛ in., all the teeth deltoid-cuspidate. *Corolla* 2–3 times the calyx. *Joints* 4–6, opaque, drab or brown.

*** *Leaves usually all 1-foliolate.*

7. **U. prunellæfolia,** *Grah. in Wall. Cat.* 5686; stems erect, leaflets oblong-lanceolate, racemes short close oblong. Hedysarum hamatum, *Heyne MSS.*

KUMAON, alt. 3000 ft., *Thomson*. EAST HIMALAYAS, *Griffith*.
Branches slender, shortly pubescent. *Leaflet* oblong or lanceolate, obtuse or acute, rounded at the base, 3–4 in. by 1–1½ in.; petiole ⅛–¼ in. *Racemes* terminal, simple, 1-2 in. by ⅝–¾ in; bracts small, lanceolate, deciduous; pedicels 2–3 times the calyx, shortly bristly. *Calyx* ⅛–⅙ in., lower teeth twice as long as the upper. *Corolla* under twice the calyx. *Joints* 3–4, placed end to end, opaque or polished.

8. **U. cordifolia,** *Wall. Pl. As. Rar.* i. 33, t. 37; stems erect, leaflet cordate-ovate, racemes elongated lax cylindrical. U. cordata, *Wall. Cat.* 5679.

PROME and banks of the Irrawaddi, *Wallich*.
Branches stout, woody, densely clothed with short spreading hairs. *Leaves* casually trifoliolate, reaching 6-9 in. long, nearly as broad, acute, conspicuously hairy on the raised veins below; petiole ⅓–2 in. *Racemes* lateral and terminal, ½–1ft. long, resembling those of *U. hamosa*; bracts small, lanceolate, deciduous; pedicels ¼–⅜ in., densely crinite. *Calyx* ⅛–⅙ in.; teeth setaceous, nearly equal. *Corolla* scarcely exserted. *Joints* 2–3, opaque, pubescent.

47. ALYSICARPUS, Neck.

Diffuse annuals or biennials. *Leaves* simple, rarely 3-foliolate, stipellate, subcoriaceous. *Flowers* in copious axillary racemes. *Calyx* glumaceous; teeth deep, often imbricated, the two upper often connate. *Corolla* not exserted; standard broad; keel obtuse, adhering to the wings. *Stamens* diadelphous; anthers uniform. *Ovary* nearly or quite sessile, many-ovuled; style incurved, stigma capitate. *Pod* terete or turgid, composed of several indehiscent 1-seeded joints. —DISTRIB. Species about 15; weeds everywhere in the tropics of the old world.

* **Microcalycinæ.** *Calyx* not longer than the first joint of the pod.

1. **A. monilifer,** *DC. Prodr.* ii. 353; stems clothed with fine spreading hairs, pod distinctly moniliform turgid veinless. *Wall. Cat.* 5769; *W. & A. Prodr.* 232. Hedysarum moniliferum, *Linn.*; *Burm. Fl. Ind.* t. 52, fig. 3; *Roxb. Hort. Beng.* 56; *Fl. Ind.* iii. 345. A. Rubibarna, *Wall. Cat.* 5771, *ex parte*.

Tropical zone; HIMALAYAS through India proper. BIRMA and TENASSERIM, *Wallich*.—DISTRIB. Nubia, Abyssinia.
Stems densely tufted, ¼–1 ft. long. *Leaves* all simple, oblong, obtuse, glabrous, ¼–½ in. long, often cordate; petiole ⅛–¼ in. long, finely downy. *Racemes* close, 4–8-flowered; pedicels very short. *Calyx* $\frac{1}{12}$–⅛ in., obscurely hairy; teeth linear, erecto-patent. *Pod* $\frac{1}{12}$ in. thick, 4–8-jointed, ½–¾ in. long, densely clothed with minute hooked pubescence, not at all reticulato-venose.

2. **A. hamosus,** *Edgew. Cat. Banda. Pl.* 47; stems densely clothed with short spreading hairs, calyx much shorter than the first joint, pod compressed reticulato-venose not moniliform. A. rotundifolius, *Wight MSS.*

Plain of BUNDELKUND and WESTERN PENINSULA.

Stems 1 ft. or less long, with many erecto-patent hairy branches. *Leaves* all simple; leaflet orbicular, obtuse, cordate, hairy on the veins below, $\frac{1}{2}$–$1\frac{1}{4}$ in. long and broad; petiole $\frac{1}{8}$–$\frac{1}{4}$ in., hairy like the branches. *Racemes* short-peduncled, moderately close, 4–6-flowered; pedicels as long as the calyx. *Calyx* $\frac{1}{24}$ in. long, the linear teeth erecto-patent. *Pod* $\frac{1}{2}$–$\frac{5}{8}$ in. long, by $\frac{1}{6}$ in., distinctly pubescent, 3–5-jointed.

3. **A. vaginalis,** *DC. Prodr.* ii. 353; stems glabrescent or with a little adpressed down, calyx as long as the first joint, pod terete reticulato-venose not moniliform. *W. & A. Prodr.* 233; *Dalz. & Gibs. Bomb. Fl.* 64. Hedysarum vaginale, *Linn.*; *Roxb. Hort. Beng.* 56; *Fl. Ind.* iii. 345. A. Rubibarna, *Wall. Cat.* 5771, *ex parte*. A. diversifolius, *Wall. Cat.* 5772. A. Harnieri, *Schweinf. Rel. Kotsch.* 24, t. 19.

HIMALAYAS to MALACCA and CEYLON, ascending to 4000 feet in the North-west provinces.—DISTRIB. Through tropics of old world, Afghanistan, introduced in America.

Stems robust, ascending, 1–3 ft. long in the type. *Leaflets* glabrous, $\frac{1}{2}$–2 in. long, cordate at the base, usually oblong, obtuse, about twice as long as broad, rarely lanceolate, 3–6 times as long as broad; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Racemes* elongated, 6–12-flowered, 2–3 in. long; pedicels shorter than the calyx. *Calyx* $\frac{1}{8}$ in., nearly glabrous; teeth linear-setaceous, exceeding the tube. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. by $\frac{1}{12}$ in., the joints half as long again as broad, faintly pubescent, rugose, usually a little thickened at the end, sometimes indistinctly moniliform.

VAR. 1. *nummularifolius*; dwarfer, leaflets smaller oblong or roundish obtuse, racemes more crowded. A. nummularifolius, *DC. Prodr.* ii. 353; *Wall. Cat.* 5767; *W. & A. Prodr.* 232; *Dalz. & Gibs. Bomb. Fl.* 64. A. varius, *Wall. Cat.* 5768. Hedysarum varium, *Roth Nov. Sp.* 354. H. cylindricum, *Poir. Dict. Suppl.* v. 400. H. nummularifolium, *Linn. Sp. Plant.* 1051. Hegetschweilera pulchella, *Regel in Bot. Zeit.* i. 47.—As common and widely spread as the type.

VAR. 2. *heterophyllus*; leaflets lanceolate, simple and trifoliolate intermixed, racemes elongated. A. heterophyllus, *Benth. MSS.* A. trifoliatus, *Stocks MSS.*—Plains of Scinde, *Dr. Stocks.*

VAR. 3. *Stocksii*; stems clothed with fine spreading hairs, leaflets thinner than in the type obovate oblong hairy beneath, racemes elongated.—Plains of Concan, *Stocks & Law.* Intermediate between the type and *A. rotundifolius.*

** **Macrocalycinæ.** *Calyx* much longer than the first joint of the pod, its teeth imbricated in the fruiting stage.

4. **A. bupleurifolius,** *DC. Prodr.* ii. 352; pedicels short, calyx ciliated only, joints of pod neither veined nor rugose. *Wall. Cat.* 5761, *excl. B & F*; *W. & A. Prodr.* 233; *Dalz. & Gibs. Bomb. Fl.* 64. Hedysarum bupleurifolium, *Linn. Sp. Pl.* 1051; *Roxb. Cor. Pl.* t. 194; *Hort. Beng.* 56; *Fl. Ind.* iii. 346. H. gramineum, *Retz.*; *Roxb. Fl. Ind.* iii. 646. A. ludens, *Wall. Cat.* 5762, *excl. B & F.*

HIMALAYAS to CEYLON and BIRMA, ascending to 4000 ft. in KUMAON.—DISTRIB. Malay isles, China, Philippines, Mauritius, Polynesia.

Stems 1–2 ft., slender, ascending, glabrous. *Leaflets* glabrous, linear or lanceolate, 1–3 in. long, acute, rather rounded at the base, rarely oblong, subobtuse. *Racemes* 3–6 in. long, the flowers in 10–20 distant pairs; pedicels very short. *Calyx* $\frac{1}{4}$ in., adpressed to the pod, hairy at the edge only; teeth twice as long as the furrowed funnel-shaped tube. *Pod* stalked, $\frac{3}{8}$–$\frac{1}{2}$ in. long, $\frac{1}{12}$ in. thick; joints 4–6, glabrous, as long as smooth, slightly moniliform.

VAR. 1. *gracilis*; leaves oblong-lanceolate obtuse 1–2 in. long, calyx not more than $\frac{1}{6}$ in. long, pod 1–2-jointed included or little exserted. A. gracilis, *Edgew. in Journ. Linn. Soc.* ix. 312; *Cat. Pl. Band.* 46.—Bundelkund, *Edgeworth.* Western Peninsula, *Wight.*

5. **A. longifolius,** *W. & A. Prodr.* 233; pedicels short, calyx slightly pubescent and ciliated, articulations of pod glabrous finely reticulato-venose. *Wt. Ic.* t. 251; *Dalz. & Gibs. Bomb. Fl.* 65. Hedysarum longifolium, *Rottl.*; *Spreng. Syst.* iii. 319. H. bracteatum, *Herb. Madr.* A. vaginalis, *Wall. Cat.* 5763 *B, C in part.* A. spicatus, *Royle MSS.*

Plains, scattered throughout INDIA PROPER.

Stems stout, ascending, subglabrous, reaching 4–5 ft. *Leaflets* oblong or lanceolate, 3–6 in. long, subcordate, ciliated on the veins below. *Racemes* moderately close, $\frac{1}{2}$–1 ft. long, the flowers adpressed to the finely hairy rachis; pedicels $\frac{1}{12}$ in. *Calyx* $\frac{1}{4}$ in.; teeth lanceolate, 4–5 times the length of the funnel-shaped plicate tube. *Pod* 4–6-jointed, usually exserted, $\frac{1}{12}$ in. broad, turgid, moniliform, marked only with a few faint raised veins.

6. **A. rugosus,** *DC. Prodr.* ii. 353; pedicels short, calyx ciliated, pod turgid moniliform deeply transversely plicate included or little exserted. Hedysarum rugosum, *Willd. Sp.* iii. 1173. A. Wallichii, *W. & A. Prodr.* 234. A. bupleurifolius, *Wall. Cat.* 5761 *B, F.* A. vaginalis, *Wall. Cat.* 5763 *C, ex parte.* A. glumaceus, *Wall. Cat.* 5764. A. glaber, *E. Meyer Comm.* 125. A. Hochstetteri, *A. Rich. Fl. Abyss.* i. 209.

HIMALAYAS (up to 4–5000 ft.) to CEYLON and BIRMA.—DISTRIB. Tropics of the old world, Cape, W. Indies.

Stems 1–2 ft., ascending, subglabrous. *Leaflets* 1–3 in. long, subglabrous below, usually oblong, obtuse, 2–3 times as long as broad, rarely orbicular or linear-lanceolate. *Racemes* dense, 1–4 in. long; pedicels $\frac{1}{12}$–$\frac{1}{8}$ in.; flowers adpressed to subglabrous rachis. *Calyx* $\frac{1}{4}$–$\frac{3}{8}$ in., glabrous on the back; teeth lanceolate, much imbricated, reaching down nearly to the base, minutely ciliated. *Pod* 3–5-jointed, included, glabrous, $\frac{1}{12}$ in. broad; joints rather broader than long, marked with close prominent transverse ribs.

VAR. 1. *Heyneanus*; more robust, reaching 3–4 ft. high, stems and leaves below permanently pubescent, leaflets large obovate-oblong, racemes longer often 4–6 in. not so close, calyx shorter ciliated on the edge only, pod $\frac{1}{8}$ in. broad often exserted. A. Heyneanus, *W. & A. Prodr.* 234; *Thwaites Enum.* 88. A. styracifolius, *Wall. Cat.* 5770, *non DC.* Hedysarum styracifolium, *Roxb. Hort. Beng.* 56: *Fl. Ind.* iii. 347. A. obovatus, *Edgw. Cat. Band. Pl.* 45.—Plains of Bundelcund, Western Peninsula and Ceylon.

VAR. 2. *styracifolius*; dwarf, diffuse, stems and leaves below finely pubescent, leaflets small oblong obtuse, rarely (*A. pilifer*, Wall.) lanceolate, racemes short dense calyx $\frac{1}{4}$ in. long conspicuously ciliated, pod $\frac{1}{12}$ in. broad rarely exserted. A. styracifolius, *DC. Prodr.* ii. 353 (*excl. syn.*); *W. & A. Prodr.* 234; *Dalz. & Gibs. Bomb. Fl.* 65. A. vaginalis, *Wall. Cat.* 5763 A. A. pilifer, *Wall. Cat.* 5765. A. scariosus, *Grah. in Wall. Cat.* 5766; *Thwaites Enum.* 88. Hedysarum glumaceum, *Koen. in Roxb. Fl. Ind.* iii. 247. A. lupulinus, *Stocks MSS.*—Ava and through India proper.

VAR. 3. *ludens*; leaves linear distant 2–3 in. long, racemes reaching $\frac{1}{2}$ ft. long the lower flowers lax, calyx $\frac{1}{3}$ in. long hairy not much ciliated. Habit of *A. bupleurifolius.* A. ludens, *Wall. Cat.* 5762 *B & F.* A. bupleurifolius, *Roxb. Herb. non Cor.*—Plains of Bengal, &c.

7. **A. tetragonolobus,** *Edgw. in Journ. Linn. Soc.* ix. 312; *Cat. Band. Pl.* 45; pedicels short, calyx pubescent densely ciliated, pod tetragonous moniliform deeply transversely plicate distinctly exserted. A. quadrangularis, *Edgw. MSS.*

Plains of BUNDELKUND, DECCAN and CONCAN.

Resembling closely the small forms of *A. rugosus*. *Stems* slender, $\frac{1}{2}$–1 ft., finely hairy. *Leaves* simple, oblong or lanceolate, 1–1$\frac{1}{2}$ in., ciliated on the nerves beneath. *Racemes* lax, 2–3 in. long, the lower flowers in distant pairs; pedicels $\frac{1}{12}$ in. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in.; teeth lanceolate, acuminate, reaching down nearly to the base. *Pod* $\frac{3}{8}$–$\frac{1}{2}$ in. by

$\frac{1}{12}$ in., 3–4-jointed, marked with an acute angle down the face, glabrous, with as deep plications as in *A. rugosus.*

8. **A. pubescens,** *Law in Wight Ic.* t. 250; pedicels 0, calyx densely clothed with long white cottony hairs, joints of pod deeply reticulated. *Dalz. & Gibs. Bomb. Fl.* 65.

Plains of CONCAN and DECCAN.

Stems ascending, 1–1$\frac{1}{2}$ ft., clothed with short adpressed hairs. *Leaves* distant, linear or lanceolate, 1–2 in. long, hairy on the nerves below, strongly triplinerved. *Spikes* close, 2–6 in. long, with a plumose rachis. *Calyx* $\frac{3}{8}$ in. long; teeth lanceolate-setaceous, densely plumose, reaching down to the base. *Pod* 3–4-jointed, included in the calyx, moniliform, glabrous; joints globose, under $\frac{1}{12}$ in. thick, the veins honeycombed.

9. **A. belgaumensis,** *Wight Ic.* t. 92; pedicels elongated finely pubescent densely ciliated, pod included finely pubescent reticulato-venose. *Dalz. & Gibs. Bomb. Fl.* 65.

Plains of CONCAN, *Dalzell, Ritchie.*

Stems 1–2 ft., clothed with dense short pubescence. *Leaves* casually 3-foliate, usually simple; leaflets oblong or lanceolate, 2–3 in. long, subcordate, clothed with adpressed short hairs beneath. *Racemes* moderately close, reaching 6–9 in. long, 1$\frac{1}{4}$–1$\frac{1}{2}$ in. broad; pedicels curved, ascending, downy $\frac{1}{2}$–$\frac{3}{4}$ in. *Calyx* $\frac{5}{8}$–$\frac{1}{2}$ in.; teeth 5, lanceolate, reaching down to the base. *Pod* 3–4-jointed, subcompressed, scarcely moniliform, $\frac{1}{8}$ in. broad, marked on the face with fine raised honeycomb veins.

VAR. 1. *racemosus*; dwarf, diffuse, leaflets obovate-oblong under 1 in. long, racemes with much fewer more distant flowers, calyx smaller, pod $\frac{1}{12}$ in. broad slightly exserted. A. racemosus, *Benth. in Hohen. Pl. Ind. Or.* No. 212; *Bedd. Ic. Pl. Ind. Or.* t. 292.—Nilghiris, *Schmidt, Wight.* Rolampally hills, Coimbatore, alt. 2500 ft., *Beddome.*

48. MECOPUS, Bennett.

An annual herb. *Leaves* 1–foliolate. *Flowers* in dense racemes. *Calyx-tube* campanulate; teeth lanceolate, the two upper connate. *Standard* broad; keel incurved, obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* stipitate, 2-ovuled; style inflexed, stigma minute capitate. *Pod* of one small oblong reticulato-venose joint on a long stalk thrust down by the twisting of the top of the pedicel so as to approach the rachis.—A single species.

1. **M. nidulans,** *Bennett Pl. Jav. Rar.* 154, t. 32; *Walp. Rep.* v. 524. Uraria retrofracta, *Wall. Cat.* 5678.

Hilly woods of BIRMA, MARTABAN and TENASSERIM.—DISTRIB. Malay isles.

An erect annual, 1 ft. or more high, with numerous slender spreading naked branches. *Leaves* simple; leaflet broader than long, membranous, glabrous, pale green, venose, truncate or faintly emarginate; base subcordate; petiole filiform, articulated and minutely stipellate at the tip. *Flowers* in dense oblong peduncled terminal heads 1 in. or less long; pedicels fascicled, $\frac{1}{4}$–$\frac{3}{8}$ in. long, finely downy, exceeding the setaceous bracts. *Calyx* and corolla very small. *Pod* with a stalk 3–4 times as long as itself.

49. OUGEINIA, Benth.

Tree. *Leaves* pinnately 3-foliolate. *Flowers* in fascicled axillary racemes. *Calyx-tube* campanulate; teeth small, upper 2 subconnate. *Corolla* much exserted; standard broad; keel obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, linear, many-ovuled; style filiform, incurved, stigma minute capitate. *Pod* linear, flat, smooth, formed of 2–5 large more or less distinct joints. —DISTRIB. A single endemic species.

1. **O. dalbergioides,** *Benth. Pl. Jungh.* 216; *Bedd. Fl. Sylv.* t. 36; *Brand. For. Flor.* 146, t. 23. Dalbergia ougeinensis, *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 220; *Wall. Cat.* 5851; *Wight Ic.* t. 391.

Hilly tracts of NORTHERN INDIA and CONCAN, ascending to 4000 ft. in KUMAON.

An erect tree, 20–40 ft. high, with slender terete grey branches. *Leaves* distinctly petioled, pinnately 3-foliolate, stipellate; leaflets rigidly coriaceous, glabrous or downy below; end leaflet roundish or obovate, 3–6 in. long, obtuse, entire or obscurely crenate; side ones smaller, opposite, oblique. *Flowers* very copious, in short fascicled racemes, from the nodes of old branches; pedicels ½–¾ in., filiform, downy or glabrous. *Calyx* ⅛–⅙ in.; teeth obtuse. *Corolla* whitish or pale rose. *Pod* 2–3 in. long; joints 2–3 times as long as broad.

50. DESMODIUM, Desv.

Shrubs or herbs. *Leaves* 3-foliolate or simple, stipellate. *Flowers* small, red, in copious usually dense racemes. *Calyx* campanulate or turbinate; teeth longer or shorter than the tube, the two upper often subconnate. *Corolla* exserted; standard broad; wings more or less adhering to the usually obtuse keel. Upper *stamen* entirely or partially free, the other 9 united. *Ovary* sessile or stipitate, few- or many-ovuled; style incurved, stigma minute capitate. *Pod* usually composed of several one-seeded indehiscent joints, the faces compressed, never muricated, the upper suture rarely finally splitting open.—DISTRIB. Species about 120; cosmopolitan in the tropics and several in the Cape and North America.

D. CAJANIFOLIUM, *DC Prodr.* ii. 331 (Hedysarum cajanifolium, *H. B. K. Nov. Gen.* t. 528. H. mucronatum, *Blume*; *Walp. Rep.* i. 746) a species widely spread in tropical America, has been introduced in Ceylon, and is included in Wallich's distribution from the Calcutta Garden as D. leptostachyum, *Wall. Cat.* 5697 A.

ORNITHOPUS PERPUSILLUS is in Schmidt's Nilghiry collection, no doubt accidentally introduced.

ARACHIS HYPOGÆA is frequently cultivated, but has no claim to be regarded as a native.

SUBGEN. 1. **Dendrolobium,** *W. & A.* *Shrubs* with woody branches, 3-foliolate leaves, flowers in dense short-peduncled or sessile axillary umbels, minute deciduous bracts.

1. **D. umbellatum,** *DC. Prodr.* ii. 325; branches terete, leaflets obtuse 1–1½ times as long as broad, joints of pod large 1½–2 times as long as broad. *W. & A. Prodr.* 224; *Bedd. Fl. Sylv.* 87; *Wall. Cat.* 5687; *Dalz. & Gibs. Bomb. Fl.* 66. Dendrolobium umbellatum, *Benth. Pl. Jung.* 218. Hedysarum umbellatum, *Linn. Sp.* 1053; *Jacq. Hort. Schoen.* t. 297, *non Roxb.* H. arboreum, *Roxb. Fl. Ind.* iii. 360.—*Burm. Zeyl.* t. 51.

Tropical zone; AVA, TENASSERIM, PENANG, MALACCA, CEYLON.—DISTRIB. Mascaren isles, Malaya, Philippines, Polynesia.

A shrub, 5–6 ft. high, with densely downy young branches. *Petioles* 1 in. or less, slightly furrowed; leaflets subcoriaceous, green and glabrous above, thinly grey-canescent or nearly glabrescent beneath, the veins not much raised; end one larger than side ones, roundish or broad-oblong, 2–3 in. long. *Umbels* 6–12-flowered; pedicels short, unequal. *Calyx* ⅙ in. densely silky; teeth shorter than or as long as the tube. *Corolla* ⅜–½ in. *Pod* 1½–2 in. long; joints 4–5, thick, glabrescent or silky, ¼–⅜ in. long, indented at both sutures.

2. **D. Cephalotes,** *Wall. Cat.* 5721; branches triquetrous, leaflets acute 2–3 times as long as broad, joints of pod small as long as broad. *W. & A.*

Prodr. 224; *Wight Ic.* t. 373; *Bedd. Fl. Sylv.* 87; *Anal. Gen.* t. 12, fig. 4. Dendrolobium cephalotes, *Benth. Pl. Jung.* 218. Hedysarum cephalotes and umbellatum, *Roxb. Fl. Ind.* iii. 360. D. congestum, *Wall. Cat.* 5723; *W. & A. Prodr.* 224; *Wight Ic.* t. 209; *Dalz. & Gibs. Bomb. Fl.* 66. D. australe, *Hassk. Pl. Jav. Rar.* 356, *non DC.* D. sericatum, *Presl, Bot. Bem.* 39. D. lineatum, *Span. in Linn.* xv. 193.

East Himalayas, tropical zone. Nipal to Chittagong, ascending to 4000 ft.; through India proper to Ceylon and Siam.—Distrib. China, Malay isles.

A shrub, several ft. high, with densely grey-silky acutely-angled zigzag branches. *Petiole* 1–2 in., thickened, deeply furrowed down the face; leaflets oblong or obovate-oblong, subcoriaceous, green and glabrous above, grey-silky with conspicuous parallel raised main veins below, the end one 3–6 in. long. *Flowers* 20 or more, in dense umbels; pedicels unequal, silvery, jointed at the apex. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in.; teeth lanceolate, as long as the tube. *Corolla* deep red, twice the calyx. *Pod* under an inch long, glabrescent or silky; joints 4–5, square, slightly indented, mainly at the lower suture.

Subgen. 2. **Phyllodium,** *Desv.* Shrubs with woody branches, 3-foliolate leaves, flowers umbellate, the umbels in long continuous rows and each hidden by a pair of persistent bracts.

3. **D. pulchellum,** *Benth. MSS.*; leaves finely downy beneath, bracts small close coriaceous plicate glabrous above, joints usually 2. Hedysarum pulchellum, *Linn.; Roxb. Fl. Ind.* iii. 361. Dicerma pulchellum, *DC. Prodr.* ii. 339; *Wall. Cat.* 5737; *W. & A. Prodr.* 230; *Wight Ic.* t. 418. Zornia pulchella, *Pers. Syn.* ii. 318. Phyllodium pulchellum, *Desv. Journ. Bot.* iii. 123, t. 5, fig. 24; *Benth. Pl. Jungh.* 217.

East Himalayas and through India proper to Ceylon, Birma, and Pegu.—Distrib. China, Philippines, Malay isles.

A shrub, 3–6 ft. high, with slender terete finely grey-downy branches. *Petiole* $\frac{1}{4}$–$\frac{1}{2}$ in.; leaflets rigidly coriaceous, green, glabrous above; end one much the largest, oblong, 3–6 in. long, obtuse or subacute, rounded at the base, sometimes slightly repand. *Racemes* $\frac{1}{4}$–1 ft. long, composed of 12–50 umbels; bracts the same texture as the leaves, orbicular, rather oblique, $\frac{3}{8}$–$\frac{1}{2}$ in., long, with a short petiole ending in a long bristle; umbels 2–6-flowered; pedicels $\frac{1}{12}$–$\frac{1}{8}$ in., downy. *Calyx* $\frac{1}{12}$ in.; teeth lanceolate, shorter than the tube. *Corolla* 3 times the calyx. *Joints* of pod rarely 1 or 3, glabrous or downy, $\frac{1}{8}$ in. long, constricted at both sutures.

4. **D. grande,** *Kurz in Journ. Asiat. Soc. Beng.* xliii. 2, 184; leaves finely downy beneath, bracts large coriaceous plicate glabrous above not close, joints 3–4.

Ava, *Kurz. Griffith* No. 1690, the exact station not known, probably Tenasserim.

Closely allied to the preceding, but considerably larger in most of its parts. *Branches* slender, terete, finely grey-downy. *Petiole* 1–1$\frac{1}{4}$ in; leaflets ovate, narrowed gradually to an acute point, the end one 4–5 in. long. *Racemes* reaching a foot long, with a downy zigzag rachis; bracts like those of the last in texture, $\frac{3}{4}$–1 in. long, more cordate at the base; pedicels $\frac{1}{6}$–$\frac{1}{4}$ in. long. *Calyx* $\frac{1}{8}$ in., finely downy; upper teeth deltoid; lowest lanceolate. *Joints* of pod $\frac{1}{6}$ in. long and broad, finely downy.

5. **D. vestitum,** *Benth. MSS.*; leaves densely downy beneath, bracts large membranous not plicate pubescent on both sides. Dicerma vestitum, *Wall. Cat.* 5739. Phyllodium vestitum, *Benth. Pl. Jungh.* 217; *Miq. Fl. Ind. Bat.* i. 261.

Martaban, *Wallich.* Tenasserim, near Mergui, *Griffith.*

Branches slender, clothed with dense short pubescence. *Leaflets* oblong, 3–4 in. long, at first densely pubescent on both sides, glabrescent above, obtuse or subacute,

rounded at the base. *Racemes* 4–6 in. long in the specimens seen; bracts 1–1¼ in. long, orbicular, not oblique, obtuse, emarginate, thinner in texture than in the other two and dissimilar to the leaves; umbels 2–3-flowered; pedicels as long as the calyx. *Calyx* ⅛ in.; teeth deltoid, two upper connate, lowest lanceolate. *Corolla* ⅜–½ in. *Joints* of pod 2–3, downy, ⅙ in. long.

SUBGEN. 3. **Dicerma,** *DC.* A trailing undershrub with small 3-foliolate exstipellate leaves, minute bracts and flowers in long racemes.

6. **D. biarticulatum,** *Benth. MSS.* Hedysarum biarticulatum, *Linn.*; *Roxb. Fl. Ind.* iii. 359. Dicerma biarticulatum, *DC. Prodr.* ii. 339; *Wall. Cat.* 5738; *W. & A. Prodr.* 230; *Wight Ic.* t. 419.

Plains of WESTERN PENINSULA, CEYLON and BIRMA.—DISTRIB. Malay isles, N. Australia.

Stems slender, densely cæspitose, ½–2 ft., glabrous or downy. *Stipules* scariose, connate, 2–3 cleft; petiole ⅛–¼ in.; leaflets rigidly coriaceous, pale green, subequal, oblanceolate-oblong, obtuse, subglabrous, ⅜–½ in. long, nearly digitate. *Racemes* peduncled, sublax, ¼–½ ft., the lower flowers 2–4 together. *Calyx* scariose, subglabrous, under 1/12 in.; teeth exceeding the tube, the two upper connate. *Corolla* 2–3 times the calyx. *Joints* usually 2, rarely 1, round-oblong, pubescent, ⅙ in. long, both sutures deeply indented.

SUBGEN. 4. **Catenaria,** *Benth.* Shrubs with woody branches, 3-foliolate leaves, long racemes, small bracts and long pendulous many-jointed pods.

7. **D. laburnifolium,** *DC. Prodr.* ii. 337. D. viticinum, *Wall. Cat.* 5709. D. cateniferum, *Arn. in Nov. Act.* xviii. 321. Hedysarum laburnifolium, *Poir. Encyc.* vi. 422. Catenaria laburnifolia, *Benth. Pl. Jungh.* 220. H. caudatum, *Thunb. Fl. Jap.* 286?

CENTRAL and EAST HIMALAYAS, tropical zone; KUMAON to ASSAM and MISHMI, ascending to 4000 ft. in SIKKIM; CEYLON.—DISTRIB. Malay isles, China, Japan.

A shrub, with slender terete branches, soon glabrescent. *Stipules* free, minute, setaceous; petiole 1–1½ in., thickened, grooved down the face; leaflets oblong-lanceolate, acute, 2–4 in. long, rigidly subcoriaceous, shining above, hairy on ribs below. *Racemes* ¼–½ ft.; pedicels ¼ in., finally spreading. *Calyx* ⅛ in.; hairs adpressed; teeth lanceolate, as long as the tube, lowest linear. *Corolla* whitish, ¼–⅓ in. *Pod* 2–3 in. long; joints 6–8, twice as long as broad, beset with minute hooked spreading hairs.

SUBGEN. 5. **Pteroloma,** *Desv.* Shrub with 1-foliolate leaves, winged petioles, racemose flowers, minute bracts and acute keel.

8. **D. triquetrum,** *DC. Prodr.* ii. 326; *Wall. Cat.* 5688; *W. & A. Prodr.* 224; *Dalz. & Gibs. Bomb. Fl.* 66. D. auriculatum, pseudo-triquetrum and alatum, *DC. loc. cit.* Hedysarum triquetrum, *Linn.*; *Roxb. Hort. Beng.* 56; *Fl. Ind.* iii. 347. H. alatum, *Roxb. Fl. Ind.* iii. 348. Pteroloma triquetrum, *Benth. Pl. Jungh.* 220.

CENTRAL and EAST HIMALAYAS, through India proper to CEYLON, ascending to 4000 ft. in KUMAON, SIKKIM and KHASIA. CHITTAGONG, TAVOY, PEGU.—DISTRIB. Seychelles, China, Philippines.

Branches triquetrous, soon glabrescent. *Leaflet* ovate or lanceolate, reaching 6–8 in. long, acute, rigidly subcoriaceous, glabrous above, hairy on the ribs below; petiole ½–1½ in., with a wing on each side, like the leaflet in texture, ⅛–¼ in. broad. *Racemes* ½–1 ft. long, axillary and terminal; pedicels ascending, ⅛–¼ in. *Calyx* ⅛ in., campanulate; upper teeth deltoid, lowest linear. *Pod* 1–2 in. long, 6–8-jointed, glabrous or pubescent; joints nearly square; lower suture faintly indented.

SUBGEN. 6. **Desmodium proper.** Erect herbs or undershrubs with

large 1–3-foliolate leaves, flowers often 2 or several from a node in long racemes simple or panicled, deciduous bracts and distinctly jointed pods.

* *Joints of pod indehiscent, 3–5 times as long as broad* (SCORPIURUS, *Benth.*)

9. **D. ormocarpoides,** *DC. Prodr.* ii. 327; petiole produced, leaves 1-foliolate, joints 6–8 flattened distinctly constricted. D. zonatum, *Miq. Flor. Ind. Bat.* i. 250. Hedysarum ormocarpoides, *Desv. MSS.* H. adhærens, *Poir. Dict. Suppl.* v. 15, *non Vahl.*

Hills of WEST PENINSULA; *Wight, Beddome*; and CEYLON, *Gardner, Thwaites.*

Stems woody, slender, obtusely angular, finely downy when young. *Leaflet* ovate, acute, rigidly subcoriaceous, 4–6 in. long, inconspicuously downy below; petiole $\frac{1}{2}$–1 in. *Racemes* terminal only, 6–9 in. long; fascicles of flower few and distant; bracts minute, setaceous; pedicels $\frac{1}{4}$–$\frac{3}{8}$ in., finally subpatent. *Calyx* $\frac{1}{12}$ in., pubescent; teeth short, deltoid. *Pod* pendulous, 3–4 in. long, under $\frac{1}{4}$ in. broad; joints ribbed horizontally, clothed with minute hooked hairs, distinctly constricted at both sutures.

10. **D. teres,** *Wall. Cat.* 5694; petiole very short, leaves 1-foliolate, joints 10–12 very narrow turgid 4–5 times as long as broad, *Benth. Pl. Jungh.* 225.

AVA; Taong-dong mountains, *Wallich.*

Branches woody, terete, very slender, finely downy. *Leaves* oblong-lanceolate, acute, 4–6 in. long, rounded at the base, subcoriaceous, glabrous above, reticulato-venose, minutely hairy on the ribs below; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Racemes* terminal and axillary, lax, 6–9 in. long, sparsely panicled; bracts minute, subulate; pedicels downy, $\frac{1}{8}$–$\frac{1}{4}$ in., finally spreading. *Calyx* $\frac{1}{12}$ in., densely hairy; teeth as long as the tube. *Pod* $1\frac{1}{2}$–2 in. by $\frac{1}{24}$ in. br., clothed with minute hooked hairs, subsessile, scarcely constricted between the joints.

11. **D. laxiflorum,** *DC. Prodr.* ii. 335; leaves 3-foliolate, joints 6–10 narrow flattened 3–4 times as long as broad. D. bicolor, *Wall. Cat.* 5719. D. elongatum, *Wall. Cat.* 5715. D. leptostachyum, *Wall. Cat.* 5697 B. D. sulcatum, *Wall. Cat.* 5736. D. recurvatum, *Grah. in Wall. Cat.* 5717; *W. & A. Prodr.* 226; *Wight Ic.* t. 374. D. diffusum, *DC. Prodr.* ii. 335, *non* 336. D. Rottleri, *G. Don Gen. Syst.* ii. 296? *non Baker.* Hedysarum recurvatum, *Roxb. Hort. Beng.* 57; *Fl. Ind.* iii. 358; *Wight Ic.* t. 409. H. diffusum, *Roxb. Fl. Ind.* iii. 357, *non Willd.* H. Roxburghii, *Spreng. Syst. App.* 292. H. Rottleri, *Spreng. Syst.* iii. 320.

HIMALAYAS, temperate and tropical regions from GHURWHAL and KUMAON to ASSAM, ascending to 6000 ft. in SIKKIM and KUMAON. WESTERN PENINSULA, AVA, PEGU, TENASSERIM.—DISTRIB. Java, Borneo, Philippines.

An erect undershrub, 3–5 ft. high, with obtusely angled branches, clothed with dense short hairs. *Petiole* 1–2 in.; leaflets membranous or subcoriaceous, glabrous above, clothed with adpressed minute hairs beneath; end one usually ovate or broad oblong, acute, sometimes obovate, subobtuse, 4–6 in. long. *Racemes* copious, axillary and terminal, the latter often compound, often a foot long; flowers several to a node and the nodes close; pedicels $\frac{1}{6}$–$\frac{1}{4}$ in., finally spreading; bracts minute, linear-subulate. *Calyx* under $\frac{1}{12}$ in., densely hairy; teeth lanceolate, longer than the tube. *Pod* 1–$1\frac{1}{2}$ in., rarely 2 in., by $\frac{1}{12}$ in., clothed with minute hooked hairs, not at all or slightly constricted at the joints.

** *Joints of pod indehiscent, as broad as long, spirally twisted; both sutures deeply indented* (CHALARIUM, *DC.*)

12. **D. spirale,** *DC. Prodr.* ii. 332; *Benth. in Mart. Fl. Bras.* xv. 105, *with many synonyms.* D. Aparines, *Hassk. Pl. Jav.* 366, *non DC.* Hedysarum spirale, *Swartz Fl. Ind. Occ.* 1273.

NORTH-WEST PROVINCES, *Royle*; BUNDELCUND, *Edgeworth.* — DISTRIB. Trop. America, Africa, Polynesia.

A cæspitose erect annual, $\frac{1}{2}$–2 feet high, with very slender glabrous stems. *Leaves* distinctly petioled, 3-foliolate, green, membranous, subglabrous; end one ovate or lanceolate, $\frac{1}{2}$–$1\frac{1}{2}$ in. long. *Racemes* copious, axillary and terminal, the latter much panicled; bracts minute, setaceous; pedicels filiform, patent, glabrous, $\frac{3}{8}$–$\frac{1}{2}$ in. *Calyx* $\frac{1}{24}$ in.; teeth as long as the tube. *Pod* $\frac{3}{8}$–$\frac{1}{2}$ in. long, $\frac{1}{24}$–$\frac{1}{12}$ broad, 4–6-jointed, glabrous.

*** *Joints of pod indehiscent, longer than broad, the lowest one distinctly stalked, the constrictions reaching from the lower nearly to the upper suture.* (PODOCARPIUM, *Benth.*)

13. **D. podocarpum,** *DC. Prodr.* ii. 336; corolla small, bracts linear minute, stalk of pod 3–4 times as long as the calyx, pedicels short, joints truncate at the apex. *Wall. Cat.* 5711, *non Hook. & Arn. Bot. Beech.* t. 98. D. japonicum, *Miq. Ann. Mus. Lugd. Bat.* iii. 46.

Temperate and tropical HIMALAYAS, alt. 2–7000 ft.; from SIMLA and GURWHAL to KHASIA and SIKKIM,—DISTRIB. China, Japan.

Stems 2–3 ft., herbaceous, angular, erect, finely pubescent. *Stipules* small, setaceous; petiole 1–3 in.; leaflets 3, membranous, both surfaces subglabrescent, the lower one pale; end one roundish, subacute, 2–3 in. long, with a deltoid base. *Racemes* few, very lax, axillary and terminal, the latter reaching a foot long, copiously panicled; bracts minute, linear; pedicels under $\frac{1}{4}$ in. *Calyx* turbinate, $\frac{1}{24}$ in., slightly bristly; teeth deltoid, very short. *Corolla* $\frac{1}{8}$ in. *Joints* 1–2, $\frac{1}{4}$ in. long by half as broad, half-rhomboidal, pubescent, the upper suture flattened.

VAR. *laxum*; leaflets larger, the end one 2–3 times as long as broad narrowed gradually to a point. D. laxum, *DC. loc. cit.* Hedysarum laxum, *Spreng. Syst. App.* 292. D. trinerve, *Grah. in Wall. Cat.* 5720.—Kumaon, Nipal and Sikkim.

14. **D. Gardneri,** *Benth. Pl. Jungh.* 226; corolla small, bracts setaceous minute, stalk of pod 8–12 times the calyx, pedicels moderately long, joints oblique or truncate at the apex. D. bambusetorum, *Miq. Flor. Ind. Bat.* i. 256? D. podocarpum, *Miq. Ann. Mus. Lugd. Bat.* iii. 46, *non DC.*

WEST PENINSULA, Shevagerry hills, *Dr. Wight.* CEYLON, *Gardner.*—DISTRIB. Japan.

General habit of the last, of which it is perhaps a mere southern variety. *Stipules* linear, $\frac{1}{4}$–$\frac{1}{8}$ in.; petiole 2–3 in.; leaflets 3, membranous, subglabrescent, the end one narrow-ovate, 4–6 in. long, narrowed gradually to a point. *Pedicels* $\frac{1}{4}$–$\frac{1}{2}$ in.; bracts, calyx and corolla of *D. podocarpum. Joints* 2–3, $\frac{1}{2}$–$\frac{5}{8}$ in. long, $\frac{1}{6}$ in. broad, cut away in an oblique line from opposite the point to the base; stalk of pod $\frac{1}{2}$–$\frac{5}{8}$ in. long.

15. **D. dolabriforme,** *Benth. Pl. Jungh.* 226; corolla small, bracts minute setaceous, stalk of pod 2–3 times as long as the calyx, pedicels short, joints oblique at the apex.

WESTERN PENINSULA, CARNATIC, near Courtallum, *Wight*; Tinnevelley, *Beddome.*

Leaves crowded on an erect stem a few inches high. *Stipules* small, lanceolate, persistent; petiole 1–$1\frac{1}{2}$ in.; leaflets 3, membranous, both surfaces green, lower obscurely pilose, end one ovate, narrowed gradually to an obtuse point, twice as long as broad, $1\frac{1}{2}$–2 in. long, base deltoid. *Racemes* simple, lax, long-peduncled, terminal, 2–3 in. long; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in., finally patent. *Calyx* $\frac{1}{16}$ in., turbinate; lower tooth lanceolate, as long as the tube, upper deltoid. *Joint* solitary, half-rhomboidal, $\frac{3}{4}$ in. long, three times as long as broad, narrowed gradually from above the middle to the tip and stalk.

16. **D. Scalpe,** *DC. Prodr.* ii. 334; corolla large, bracts large ovate, pedicels very long, stalk of pod twice as long as the calyx. D. strangulatum, *W. & A. Prodr.* 228; *Wight Ic.* t. 985. D. trichocaulon, *Hassk. Pl. Jav. Rar.* 367,

non DC. D. caffrum, *Eckl. & Zey. Herb. Cap.* No. 1662. D. Schimperi, *Hochst.*; *A. Rich. Fl. Abyss.* i. 205. D. abyssinicum and repandum, *DC. Prodr.* ii. 338 and 334 ?

Hills of the WESTERN PENINSULA and CEYLON.—DISTRIB. Malay and Mascaren isles, Abyssinia, Natal.

Stems 3–4 feet high, erect, woody in the lower part, densely downy. *Stipules* $\frac{1}{4}$–$\frac{1}{3}$ in., lanceolate, persistent; petiole 2-3 in.; leaflets 3, membranous, finely downy on both surfaces, often slightly repand; end one 2–4 in. long, roundish- or obovate-rhomboidal, base and apex subdeltoid. *Racemes* very lax, mostly terminal, often a foot long, simple or forked at the base; bracts boat-shaped, enclosing the buds, soon falling; pedicels capillary, permanently ascending, lower 1–1$\frac{1}{2}$ in. long. *Calyx* $\frac{1}{8}$ in., downy; lower tooth lanceolate, as long as the tube; upper deltoid. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in., bright red. *Joints* 1–3, half-rhomboidal, $\frac{1}{4}$–$\frac{1}{3}$ in. long by half as broad; apex oblique; upper suture rather recurved.

17. **D. obcordatum,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 229; corolla small, bracts large linear-subulate caducous, stalk of pod not longer than the calyx. Uraria obcordata, *Miq. Flor. Ind. Bat. Suppl.* 114, 305.

TENASSERIM, *Kurz.*

A twining perennial, 3–4 ft. high, with puberulous stems. *Stipules* lanceolate, $\frac{1}{4}$ in.; petiole $\frac{1}{2}$–1 in.; leaflets chartaceous, pale, thinly downy and prominently veined beneath, end one obcordate-lunate, $\frac{1}{2}$–2 in. broad, emarginate with a mucro, lateral ones smaller, deltoid. *Racemes* slender, pubescent, axillary and forming a terminal panicle; bracts very caducous. *Calyx* $\frac{1}{12}$ in., pubescent; teeth lanceolate, acuminate. *Corolla* purple, under $\frac{1}{4}$ in. Joints of *pod* 1–3, round-hastate, $\frac{1}{8}$ in. long and broad, flat, puberulous.

**** *Joints of pod indehiscent, once or twice as long as broad; upper suture straight or slightly indented; calyx-teeth deltoid, never exceeding the tube* (DOLLINERA, *Endl.*) All shrubby.

† *Leaves 1-foliolate.*

18. **D. oblongum,** *Wall. Cat.* 5714; leaflets 3–4 times as long as broad thinly silky beneath. *Benth. Pl. Jungh.* 224.

AVA; Taong-dong mountains, *Wallich.*

Stems slender, woody, finely downy. *Leaflet* oblong, 3–5 in. long, obtuse, rounded at the base, subcoriaceous, green, glabrous above; petiole $\frac{1}{2}$–$\frac{3}{4}$ in. *Racemes* very lax, axillary and terminal, copiously panicled, 4–6 in. long, most of the flowers in distant pairs; pedicels $\frac{3}{8}$–$\frac{1}{2}$ in.; bracts $\frac{1}{8}$ in., ovate-cuspidate. *Calyx* $\frac{1}{12}$ in., lowest tooth lanceolate, as long as the tube. *Corolla* $\frac{3}{8}$ in. *Pod* $\frac{3}{4}$–1 in. long, $\frac{1}{8}$ in. broad, 6–7-jointed, thinly closely silky, the upper suture slightly indented.

19. **D. oblatum,** *Baker*; *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 230; leaflet broader than long glabrous beneath.

BIRMA; forests of Pegu, Ava and Martaban, *Kurz.*

Stems slender, woody, glabrous. *Leaflet* membranous, $\frac{3}{4}$–1 in. long, 1$\frac{1}{2}$ in. broad, green above, grey-green beneath; petiole $\frac{1}{2}$–$\frac{5}{8}$ in. *Racemes* very lax, axillary and terminal, the end one panicled; pedicels erecto-patent, $\frac{1}{4}$–$\frac{3}{8}$ in. *Calyx* $\frac{1}{24}$ in., thinly silky; teeth as long as the tube, lowest lanceolate, the others deltoid. *Corolla* 3–4 times the calyx. *Pod* $\frac{1}{2}$–$\frac{5}{8}$ in. long, $\frac{1}{6}$ in. broad, 3–4-jointed, subglabrous, distinctly stalked; upper suture slightly indented.—Very near *D. reniforme*, DC., from which it differs by its longer pedicels and more deeply indented pod.

†† *Leaves 3-foliolate.*

20. **D. sinuatum,** *Blume MSS.*; leaflets repand, pedicels short, corolla small, bracts setaceous, joints many small clothed with minute hooked hairs. D. strangulatum var. sinuatum, *Miq. Flor. Ind. Bat.* i. 255.

KHASIA, tropical zone, alt. 3–5000 ft., *Hook. fil. & Thomson.* MISHMI, *Griffith.*—DISTRIB. Malay isles.

Branches terete, woody, minutely downy. *Petiole* 1–$1\frac{1}{2}$ in.; leaflets subcoriaceous, pale, minutely downy or nearly glabrescent beneath; end one roundish-rhomboidal, obtuse, 2–3 in. long, conspicuously repand in the upper half. *Racemes* copious, terminal and axillary, moderately close, not more than 3–4 in. long; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in., finely downy. *Calyx* $\frac{1}{12}$ in.; teeth as long as the tube. *Corolla* $\frac{1}{4}$ in. *Pod* $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, under $\frac{1}{8}$ in. broad; joints 8–12, as broad as long.

21. **D. floribundum,** *G. Don Gen. Syst.* ii. 297; leaflets entire, pedicels short, corolla large, bracts lanceolate large, joints many small clothed with adpressed silky hairs. D. multiflorum, *DC. Prodr.* ii. 335; *Wall. Cat.* 5705. D. angulatum, *DC. Prodr.* ii. 335, *non Wall.* D. dubium, *Lindl. Bot. Reg.* t. 967; *Bot. Mag.* t. 2960. D. sambuense, *DC. Prodr.* ii. 335? Hedysarum floribundum, *Don Prodr.* 244. H. Wallichianum, *Spreng. Syst. App.* 292. H. sambuense, *Don Prodr.* 243?

HIMALAYAS, tropical and temperate zones, from the UPPER PUNJAB to KHASIA, ascending to 7000 ft.

Branches woody, angular, densely pubescent. *Stipules* lanceolate, $\frac{1}{3}$ in.; leaflets subcoriaceous, green, with a few adpressed hairs above, densely clothed with adpressed grey silky hairs and finely reticulato-venose beneath; end one obovate-oblong, 3–4 in. long, obtuse or subacute. *Racemes* very copious, axillary and terminal, moderately close, 3–6 in. long, often second; bracts acuminate, ciliated, $\frac{1}{4}$ in. long; pedicels $\frac{1}{4}$ in., erecto-patent, finely hairy. *Calyx* $\frac{1}{8}$ in.; teeth as long as the tube. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in. *Pod* $\frac{3}{4}$–1 in. long, under $\frac{1}{8}$ in. br.; joints 6–8, rather longer than broad.

22. **D. confertum,** *DC. Prodr.* ii. 335; leaflets entire, pedicels short, bracts and corolla large, joints few large densely clothed with spreading silky hairs. D. barbatum, *Wall. Cat.*, 5724, *non Benth.* (Hedysarum, *Linn.*)

CENTRAL and EAST HIMALAYAS, alt. 2–4000 ft.; NIPAL, SIKKIM and KHASIA.

Branches terete, finely downy when young. *Petiole* 1–$1\frac{1}{2}$ in.; leaflets subcoriaceous, glabrous above, distinctly reticulato-venose, pale, minutely hairy below; end one obovate or oblong, obtuse or acute, 3–6 in. long. *Racemes* copious, short, dense, axillary and terminal, the latter panicled, often subsecund; bracts $\frac{1}{4}$ in. long, lanceolate, scariose; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in., ascending. *Calyx* $\frac{1}{8}$ in., turbinate, subglabrous; lower teeth lanceolate, as long as the tube; upper deltoid. *Corolla* 3–4 times the calyx. *Pod* 1–$1\frac{1}{2}$ in. long, under $\frac{1}{4}$ in. broad; joints 3–4, twice as long as broad, the constriction from below reaching more than half way through.

23. **D. oxyphyllum,** *DC. Prodr.* ii. 336; leaflets acute thinly silky beneath, pedicels long, bracts lanceolate acuminate, corolla large, joints many large glabrescent. D. serriferum, *Wall. Cat.* 5708 B.

CENTRAL and EAST HIMALAYAS, tropical and temperate zones. KUMAON and SIMLA to ASSAM and KHASIA, ascending to 7000 ft.

Branches slender, terete, soon glabrescent. *Petiole* 1–$1\frac{1}{2}$ in.; leaflets membranous or subcoriaceous, green, glabrous above, pale, thinly grey-silky beneath; end one obovate-oblong, usually twice as long as broad, narrowed gradually to a point, entire or obscurely repand, 2–4 in. long. *Racemes* copious, short, moderately close, axillary and terminal, the latter much panicled; bracts lanceolate, acuminate, ciliated, $\frac{1}{4}$ in. long; pedicels ascending, subglabrous $\frac{3}{8}$–$\frac{1}{2}$ in. *Calyx* $\frac{1}{12}$ in., subglabrous; teeth very short. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in. *Pod* 2–3 in. long, $\frac{1}{4}$ in. broad, shortly stalked; joints 6–10, rather longer than broad.

VAR. *serriferum*; leaflets obtuse repand densely silky beneath, pedicels spreading or deflexed $\frac{1}{3}$–$\frac{3}{4}$ in. long clothed with spreading silky hairs like the calyx. D serriferum, *Wall. Cat.* 5708 A. D. polycarpum, *Wall. Cat.* 5710, *non DC.*—Nipal, *Wallich.*

24. **D. tiliæfolium,** *G. Don. Gen. Syst.* ii. 297; leaflets obtuse or subacute densely hoary beneath, pedicels moderately long, bracts lanceolate, corolla large, joints many thinly clothed with adpressed silky hairs. *Wall. Cat.* 5707. D. nutans, *Wall. Cat.* 5706; *Bot. Mag.* t. 2867. D. argenteum, *Wall. Cat.* 5713. Hedysarum tiliæfolium, *Don Prodr.* 244.

All along the HIMALAYAS from the UPPER PUNJAB to TAVOY, temperate and tropical zones, ascending to 9000 ft.

Branches slender, terete, finely downy. *Petiole* 2–3 in; leaflets thick, flexible, subcoriaceous, green, glabrescent above, more or less densely persistently matted with whitish silky hairs beneath; end one broad obovate, 2–4 in. long, entire or obscurely repand, base deltoid or rather rounded. *Racemes* copious, lax, often a foot long, axillary and terminal, the latter often copiously panicled, with lower branches again compound; pedicels $\frac{1}{4}$–$\frac{3}{8}$ in., ascending, finely downy. *Calyx* $\frac{1}{8}$ in., downy; teeth deltoid, shorter than the tube. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in. *Pod* 2–3 in. long, $\frac{1}{4}$ in. broad; joints 6–9, longer than broad.

***** *Joints of pod as in the last group, but the calyx-teeth narrower and longer.* (HETEROLOMA, *Benth.*)

† *Leaves* 1-*foliolate.*

25. **D. flexuosum,** *Wall. Cat.* 5691; leaflet membranous orbicular glabrous on the upper surface. *Benth. Pl. Jungh.* 224.

BIRMA; Prome hills, *Wallich.*

Stems slender, woody, flexuose, trailing, clothed throughout with spreading or deflexed bristly hairs. *Leaflet* 2–3 in. long and broad, obtuse, or obscurely cuspidate, rounded or slightly cordate at the base, thinly coated with adpressed grey hairs below; petiole 1–1$\frac{1}{2}$ in. *Racemes* terminal and lateral, distinctly peduncled, 2–3 in. long, moderately close; pedicels $\frac{1}{8}$ in., slender, ascending; bracts setaceous, minute. *Calyx* $\frac{1}{12}$ in., bristly, teeth lanceolate. *Corolla* $\frac{1}{8}$ in. *Pod* glabrescent, 5–6-jointed, only seen immature.

26. **D. gangeticum,** *DC. Prodr.* ii. 327; leaflet membranous or subcoriaceous oblong entire acute glabrescent on the upper surface. *Wall. Cat.* 5689; *W. & A. Prodr.* 225; *Wight Ic.* 271; *Dalz. & Gibs. Bomb. Fl.* 66. D. latifolium, *Wight Ic.* t. 272, *non* t. 270. Hedysarum gangeticum, *Linn.*; *Fl. Ind.* iii. 349. H. collinum, *Roxb. loc. cit.*

HIMALAYAS (ascending to 5000 ft. on the Chenab) to PEGU and CEYLON.—DISTRIB. Trop. Africa, Malay isles, Philippines, China; introduced in West Indies.

Stems suberect, reaching 3–4 ft. high, woody, slightly angular, clothed with short grey down upwards. *Leaflet* oblong, usually 3–6 in. long, not more than $\frac{1}{2}$–$\frac{1}{3}$ as broad, rounded at the base, narrowed gradually to an acute point, thinly clothed beneath with adpressed grey hairs, not reticulato-venose; petiole $\frac{1}{2}$–1 in. *Racemes* copious, ascending, lateral and terminal, the latter sublax, 6–12 in. long, simple or with a few short ascending branches in the lower part; pedicels $\frac{1}{12}$–$\frac{1}{4}$ in., ascending; bracts minute, setaceous. *Calyx* under $\frac{1}{12}$ in., finely downy; teeth lanceolate. *Corolla* $\frac{1}{8}$–$\frac{1}{6}$ in. *Pod* falcate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{12}$–$\frac{1}{8}$ in. broad, 6–8-jointed, glabrescent or clothed with minute hooked hairs.

VAR. *maculatum*; dwarf, a foot or less high, leaflet roundish-cordate 1 in. or less long. *Dill. Hort. Elth.* t. 141, fig. 168. D. maculatum, *DC. Prodr.* ii. 327; *Wall. Cat.* 5690. Hedysarum maculatum, *Linn. Sp. Pl.* 1051.—Rohilcund, Upper Bengal, &c.

27. **D. latifolium,** *DC. Prodr.* ii. 327; leaflet ovate thick subcoriaceous obscurely repand usually subobtuse persistently scabrous with adpressed bristly hairs on the upper surface. *Wall. Cat.* 5692; *W. & A. Prodr.* 225; *Wight Ic.* t. 270; *Dalz. & Gibs. Bomb. Fl.* 66. D. collinum, *Wall. Cat.* 5693. D.

lasiocarpum, *DC. loc. cit.* D. virgatum, *Zolling in Flora*, 1847, 697. Hedysarum latifolium, *Roxb. Hort. Beng.* 57; *Fl. Ind.* iii. 350; *Ker. Bot. Reg.* t. 355. Anarthrosyne cordata, *Klotzsch in Peters Mossamb. Bot.* 39, t. 7.

HIMALAYAS (ascending to 4000 ft. in SIKKIM) to BIRMA, SIAM and CEYLON.—DISTRIB. Trop. Africa, Madagascar, Malay isles, Philippines; introduced in W. Indies.

An erect undershrub, 3–6 ft. high, with terete branches densely clothed with short brown pubescence. *Leaflets* 3–6 in. long, $1\frac{1}{2}$–2 as long, as broad, usually cordate or truncate, rarely deltoid at the base, reticulato-venose, densely clothed with short soft brown hairs beneath; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. *Racemes* copious, ascending, 2–6 in. long, sessile or short-peduncled, spike-like, usually dense, axillary and terminal, the latter compound; pedicels $\frac{1}{12}$ in. or less, densely downy; bracts minute, setaceous. *Calyx* $\frac{1}{24}$ in.; teeth linear-lanceolate, as long as the tube. *Corolla* 3–4 times calyx. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{12}$ in. broad, 4–6-jointed, densely clothed with minute hooked hairs, the upper suture slightly indented.

†† *Leaves 3-foliolate.*

28. **D. Thwaitesii,** *Baker*; herbaceous, stems slender terete, leaflets obovate entire, bracts lanceolate-acuminate middle-sized, joints twice as long as broad. D. strangulatum, var. minor, *Thwaites Enum.* 87.

CEYLON, *Thwaites C.P.* 3327.

Stems a foot or more long, clothed upwards with dense spreading grey hairs. *Petiole* $\frac{1}{2}$–$\frac{3}{4}$ in.; leaflets membranous, green, glabrous above, clothed below with short adpressed grey hairs; end one 1–$1\frac{1}{4}$ in. long. *Racemes* few, long-peduncled, lateral and terminal, lax, few-flowered; pedicels $\frac{1}{2}$–$\frac{5}{8}$ in., spreading or ascending. *Calyx* under $\frac{1}{12}$ in.; teeth lanceolate. *Corolla* $\frac{1}{6}$ in. *Pod* 1–$1\frac{1}{4}$ in. by $\frac{1}{8}$ in.; joints about 4, minutely pubescent, scarcely constricted at the upper suture.—Habit of *D. polycarpum var. trichocaulon*, from which it differs by its pod, long pedicels, and lax racemes.

29. **D. Wightii,** *Grah. in Wall. Cat.* 5718; herbaceous, stems slender angular, leaflets ovate-oblong acute subrepand, bracts minute setaceous, joints small as long as broad. *W. & A. Prodr.* 226; *Thwaites Enum.* 87. D. Walkeri, *Arn. Pug.* 13. D. Pryoni, *DC. Prodr.* ii. 334?

NILGHIRI Hills and CEYLON.

Stems erect, clothed when young with fine short spreading grey hairs. *Stipules* large, lanceolate, acuminate, not amplexicaul; petiole 1–$1\frac{1}{2}$ in.; leaflets membranous or subcoriaceous, green and smooth above, grey clothed with short adpressed hairs beneath; end one 2–4 in. long, narrowed gradually to a point. *Racemes* copious, lax, lateral and terminal, the latter reaching a foot long, usually simple; pedicels $\frac{1}{4}$–$\frac{3}{8}$ in., ascending or spreading. *Calyx* $\frac{1}{16}$ in.; teeth lanceolate, longer than the tube. *Corolla* 3 times calyx. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. long, under $\frac{1}{8}$ in. broad, glabrescent, 4–6-jointed; upper suture distinctly indented.

30. **D. diffusum,** *DC. Prodr.* ii. 336, *non* 335; herbaceous, stems stout angular deeply sulcate, leaflets obovate entire, bracts minute lanceolate, joints small as long as broad. *W. & A. Prodr.* 226; *Wight Ic.* t. 298. D. dichotomum, *DC. Prodr. loc. cit.* D. Roxburghii, *Wall. Cat.* 5716. D. Willdenovii, *G. Don Gen. Syst.* ii. 296. D. quinquangulare, *Wight Ic.* t. 293. Hedysarum diffusum and dichotomum, *Willd. Sp. Pl.* iii. 1180. H. articulatum and quinquangulatum, *Roxb. Fl. Ind.* iii. 355.

Plains of the WESTERN PENINSULA, BUNDELKUND, BENGAL and PROME, ascending to 4000 ft. in the Vindhia chain (*Edgeworth*).

Stems 1–2 ft. long, diffuse, cæspitose, prominently angled, clothed with spreading grey hairs. *Stipules* large, leafy, amplexicaul, auricled; petiole 1–$1\frac{1}{2}$ in.; leaflets

subcoriaceous, rather scabrous above, with obscure adpressed hairs, reticulato-venose, finely grey-downy below; end one obtuse, obovate, rarely roundish or oblong, 2–3 in. long. *Racemes* copious, lateral and terminal, lax or moderately close, reaching a foot long, the end one panicled; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in., pubescent, erecto-patent. *Calyx* $\frac{1}{24}$ in.; teeth deep, setaceous. *Corolla* twice the calyx, the smallest of all the species. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{12}$–$\frac{1}{8}$ in. broad; joints 4–6, densely clothed with minute spreading hooked grey hairs; upper suture distinctly indented.

31. **D. sequax,** *Wall. Pl. As. Rar.* t. 157; shrubby, branches terete, leaflets ovate-oblong acute repand, bracts very minute, upper suture slightly indented. *Wall. Cat.* 5712.

Along the Himalayas from SIMLA and KUMAON to SIKKIM, alt. 4–7000 ft.

A shrub, reaching 2–30 ft. high, the branches clothed with dense short grey or brown pubescence. *Petioles* 1–2 in.; leaflets subcoriaceous, subscabrous, with short obscure adpressed hairs above, grey and more densely hairy beneath; end one 3–5 in. long, narrowed gradually to a point. *Racemes* copious, moderately lax, lateral and terminal, 2–4 in. long, the end one panicled; pedicels $\frac{1}{6}$–$\frac{1}{4}$ in., downy, spreading or ascending. *Calyx* $\frac{1}{12}$ in.; teeth lanceolate. *Corolla* 3 times calyx. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{12}$ in. broad, 6–8-jointed, short-stalked, densely clothed with minute spreading hooked hairs.

32. **D. concinnum,** *DC. Prodr.* ii. 335; shrubby, branches terete, leaflets oblong entire obtuse, bracts large ovate, upper suture not indented. D. pendulum, *Wall. Pl. As. Rar.* t. 94. D. penduliflorum, *Wall. Cat.* 5727. D. paucinervium, *DC. Prodr.* ii. 336.

All along the HIMALAYAS from the UPPER PUNJAB to SILHET and KHASIA, ascending to 7000 ft. in SIMLA. PEGU, *McClelland.*

A tall shrub, with slender drooping branches, densely clothed at first with short grey pubescence. *Petioles* $\frac{1}{2}$–1 in.; leaflets subcoriaceous, green, smooth above, with raised parallel main veins and clothed with adpressed grey or brownish silky hairs beneath; end one 2–3 in. long; side ones smaller. *Racemes* copious, lax, lateral and terminal, the latter often $\frac{1}{2}$–1 ft. long, usually simple; pedicels $\frac{1}{2}$–$\frac{5}{8}$ in., ascending; bracts $\frac{1}{4}$–$\frac{3}{8}$ in., closely imbricated, densely silky. *Calyx* $\frac{1}{12}$ in.; teeth lanceolate-deltoid. *Corolla* $\frac{1}{4}$–$\frac{1}{3}$ in. *Pod* $\frac{3}{4}$–1 in. long, $\frac{1}{8}$ in. broad, short-stalked, 4–6-jointed, minutely downy.

VAR. *amœnum*; leaflets narrowed to an acute point, racemes most or all terminal. D. amœnum, *Wall. Cat.* 5726.—Khasia and Silhet.

****** *Joints of pod small, as long as broad, sometimes splitting along the lower suture; upper suture straight, lower slightly constricted. Calyx-teeth long.* (NICOLSONIA (*DC.*))

33. **D. retroflexum,** *DC. Prodr.* ii. 336; pedicels sharply reflexed, leaves usually 1-foliolate, leaflet rotundato-cordate. D. orbiculatum, *Wall. Cat.* 5695. D. rotundifolium, *Wall. Cat.* 5696. Uraria? styracifolia, *W. & A. Prodr.* 222. Hedysarum retroflexum, *Linn. Mant.* 103. H. styracifolium, *Linn. Mant.* 103, *non aliorum.*

ASSAM, SILHET and TENASSERIM, tropical zone.—DISTRIB. China.

Branches terete, woody, clothed with short spreading hairs at first. *Leaves* subcoriaceous, thick, green, glabrous above, densely coated with adpressed white silky hairs beneath, 1–2 in. long and broad; side leaflets when present much smaller than the end one; petiole $\frac{1}{2}$–1 in., deflexed at tip. *Racemes* copious, simple, axillary and terminal, very dense, subsessile, an inch or less long; bracts ovate, ciliated; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in. *Calyx* $\frac{1}{12}$ in., densely bristly. *Corolla* twice the calyx. *Pod* $\frac{3}{8}$–$\frac{1}{2}$ in. long, obscurely hairy, under $\frac{1}{8}$ in. broad; joints 3–5.

34. **D. capitatum,** *DC. Prodr.* ii. 336; leaflets always 3 obovate-cuneate, pedicels sharply reflexed. D. obovatum, *Wall. Cat.* 5722 B. D. polycarpum,

W. & A. Prodr. 227, *ex parte.* Hedysarum capitatum, *Burm. Fl. Ind.* 167, t. 64, fig. 1. H. conicum, *Poir. Encyc.* vi. 419. Pseudarthria capitata, *Hassk. Pl. Jav. Rar.* 390.

CEYLON, *Burmann.* PROME hills, *Wallich.*—DISTRIB. Malay isles, Philippines.

Branches woody, terete, argenteo-canescent when young. *Petiole* ½–1 in.; leaflets subcoriaceous, green, glabrescent above, densely persistently coated with adpressed white silky hairs below; end one 1–1½ in. long, retuse. *Racemes* copious, axillary and terminal, simple, dense, nearly sessile, 1–2 in. long; pedicels ⅛–¼ in.; bracts small, ovate-cuspidate, ciliated. *Calyx* $\frac{1}{12}$ in. glabrescent; teeth deep, setaceous. *Corolla* twice the calyx. *Pod* ½–¾ in. long, glabrescent, 4–6-jointed, ⅛ in. broad.

35. **D. Griffithianum,** *Benth. Pl. Jungh.* 222; herbaceous, trailing, leaflets 3, pedicels deflexed at the tip, corolla small.

KHASIA, alt. 4–6000 ft., *Griffith, Hook. fil. & Thomson.*

Stems 1–2 ft. long, moderately robust, densely clothed upwards with fine spreading hairs. *Petiole* ½–1 in.; leaflets always 3, subcoriaceous, green, glabrous above, clothed with short inconspicuous adpressed hairs beneath; end one obovate-oblong, obtuse, ¾–1 in. long. *Racemes* terminal, peduncled, 2–6 in. long, dense in the upper part; bracts ¼–⅜ in, ovate-cuspidate, densely silky; pedicels ⅛–⅙ in., silky, erecto-patent. *Calyx* ⅛ in., densely silky; teeth deep, setaceous. *Corolla* twice the calyx. *Pod* ½–⅝ in. by $\frac{1}{12}$ in., 4–5-jointed, obscurely downy.

36. **D. brachystachyum,** *Grah. MSS.*; herbaceous, trailing, leaves 1-foliolate, pedicels reflexed at the tip. *Benth. Pl. Jungh.* 223.

UPPER GANGETIC PLAIN, *Hamilton, Edgeworth, &c.*

Stems cæspitose, slender, a foot long, glabrous except at the top. *Leaflets* round- or broad-oblong, cordate, ¾–1¼ in. long, obtuse or emarginate, subcoriaceous, glabrous above, reticulato-venose and inconspicuous hairy below; petiole ½ in. *Racemes* copious, close, under 1 in. long, axillary and terminal, nearly sessile; bracts lanceolate, under ¼ in.; pedicel ⅛–⅙ in., abruptly cernuous at the tip, as in *Uraria. Calyx* ⅛ in., clothed all over with dense white hairs; teeth long, lanceolato-cuspidate. *Corolla* twice the calyx. *Pod* sessile, 2-jointed, glabrous, not longer than the calyx.

37. **D. rufescens,** *DC. Prodr.* ii. 335? erect, shrubby, leaflets 3, pedicels finally spreading or cernuous, corolla large. *W. & A. Prodr.* 228; *Wight Ic.* t. 984; *Illust.* t. 79. D. ferrugineum, *Wall. Cat.* 5732; *Thwaites Enum.* 87.

NILGHIRIS and CEYLON, up to 4000 ft.

An erect undershrub, with young branches densely clothed with short ferruginous silky hairs. *Petiole* 1–1½ in.; leaflets subcoriaceous, glabrous above, more or less densely argenteo-canescent beneath; end one obovate-oblong, 1–2 in. long, obtuse, with a mucro. *Racemes* usually terminal, 3–6 in. long, dense in the upper part; bracts ovate-acuminate, ¼–⅜ in., densely silky; pedicels ¼–⅜ in., densely silky. *Calyx* ⅛ in.; teeth lanceolate, exceeding the tube; lowest linear. *Corolla* ⅜–½ in. *Pod* short-stalked, 1–1¼ in. by ⅛ in., 6–8-jointed, minutely downy.

38. **D. polycarpum,** *DC. Prodr.* ii. 334; shrubby, suberect, leaflets 3, pedicels ascending, corolla, bracts and joints of pod small. *W. & A. Prodr.* 227; *Wight Ic.* t. 406, *non Wall.*; *Dalz. & Gibs. Bomb. Fl.* 66. D. angulatum, *Wall. Cat.* 5729 *ex parte, non DC.* D. ovalifolium, *Wall. Cat.* 5730. D. siliquosum, *DC. Prodr.* ii. 336. D. heterocarpum, *DC. Prodr.* ii. 337. D. retusum, *G. Don Gen. Syst.* ii. 297. D. gyroides, *Hassk. Pl. Jav. Rar.* 362, *non DC.* D. Buergeri, *Miq. Ann. Mus. Lugd. Bat.* iii. 45. D. nervosum, *Vogel. Pl. Meyen,* 28. D. patens, *Wight Ic.* t. 407. Hedysarum polycarpum, *Lam. Ill.* t. 628. H. siliquosum, *Burm. Fl. Ind.* 169, t. 55, fig. 2. H. heterocarpum, *Linn. Sp.* 1054. H. purpureum, *Roxb. Hort. Beng.* 57; *Fl. Ind.* iii. 358. H. retusum, *Don Prod.* 243. H. patens, *Roxb. Fl. Ind.* iii. 362.

HIMALAYAS, (ascending to 5000 ft.) and everywhere in the plain to BIRMA, MALACCA and CEYLON.—DISTRIB. Zanzibar, Malay isles, Philippines, China, Japan, Polynesia.

An erect or suberect undershrub, with woody slightly angular slender branches, clothed upwards with short adpressed grey hairs. *Petiole* $\frac{1}{2}$–1 in.; leaflets subcoriaceous, green, glabrous above, thinly clothed with adpressed grey hairs beneath; end one obovate-oblong, obtuse, 1–3 in. long; side ones smaller. *Racemes* terminal and lateral, close, short-peduncled, 1–3 in. long, the end one sometimes branched; bracts $\frac{1}{8}$–$\frac{1}{6}$ in.; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in., glabrous. *Calyx* $\frac{1}{12}$ in.; teeth acuminate, exceeding tube. *Corolla* under $\frac{1}{4}$ in. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$ in. br., glabrescent or minutely downy, 5–8-jointed.

VAR. *trichocaulon*; stems densely clothed upwards or throughout with spreading grey hairs, bracts larger. D. trichocaulon, *DC. Prodr.* ii. 335. D. tenue, *Grah. in Wall. Cat.* 5731. D. serpens, *Wall. Cat.* 5733. D. angulatum, *Wall. Cat.* 5729, B, D, F, *ex parte, non DC.* D. distans, *Royle MSS.*—Range of the type, ascending to 7000 ft. in Kumaon.

39. **D. jucundum,** *Thwaites Enum.* 411; shrubby, erect, leaflets 3, pedicels ascending, corolla bracts and joints of pod large.

CEYLON; Matelle district, *Thwaites.*

An erect much-branched undershrub, the young stems densely clothed with short ferruginous silky hairs. *Leaves* coriaceous, the under side densely coated with adpressed grey or pale brown silky hairs, the main veins much raised; end one obovate-oblong, obtuse, $1\frac{1}{2}$–3 in. long; base subcuneate; petiole $\frac{1}{2}$–1 in. *Racemes* terminal, peduncled, 4–6 in. long, close upwards; bracts $\frac{3}{8}$ in., ovate, silky; pedicels $\frac{1}{8}$ in. *Calyx* $\frac{1}{8}$ in; teeth lanceolate, acuminate, exceeding tube. *Corolla* $\frac{1}{2}$ in. *Pod* 1–$1\frac{1}{4}$ in. by $\frac{1}{6}$ in.; joints 4–6, rather longer than broad, minutely downy.

40. **D. rotundifolium,** *Baker, non Wall.*; annual, stems very slender, leaves 1-foliolate, leaflet orbicular, racemes very lax few-flowered, pedicels ascending, corolla exserted. Alysicarpus rotundifolius, *Dalzell MSS.*

Plains of CONCAN, *Dr. Ritchie.*

Stems erect, under a foot high, with many ascending branches, thinly clothed with fine short spreading hairs. *Leaflet* round, $\frac{1}{2}$–$\frac{3}{4}$ in. long, obtuse or obscurely cuspidate, slightly cordate, membranous, grey-green below with only a few obscure adpressed hairs; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. *Racemes* copious, terminal and lateral, the former forked, 3–4 in. long, the lower flowers in distant pairs, upper solitary; pedicels $\frac{1}{2}$–$\frac{5}{8}$ in. long, arcuate, finely pubescent. *Calyx* $\frac{1}{8}$ in., thinly hairy; teeth linear-setaceous, very deep. *Pod* $\frac{1}{4}$–$\frac{3}{8}$ in. long, under $\frac{1}{12}$ in. broad, falcate; joints 3–5, glabrescent, reticulato-venose.

41. **D. parviflorum,** *Baker*; annual, stems very slender, leaves oblong 1- and 3-foliolate intermixed, racemes very lax many-flowered, pedicels ascending, corolla included. Alysicarpus parviflorus, *Dalz. in Hook. Kew Journ.* iii. 211; *Dalz. & Gibs. Bomb. Flora*, 65.

Plains of CONCAN, *Dalzell, Ritchie.* Anamallay forest, *Wight.*

Stems diffuse, 1–2 ft. long, much branched, clothed with short spreading grey hairs. *Leaflets* membranous, mostly simple, oblong, 1–$1\frac{1}{2}$ in. long, obtuse or subacute, subcordate, with only a few adpressed grey hairs beneath; side ones, if present, much smaller; petiole $\frac{1}{4}$–$\frac{1}{3}$ in. *Racemes* usually terminal, simple, 4–8 in. long, the lower flowers in distant pairs; pedicels capillary, $\frac{1}{2}$–$\frac{3}{4}$ in., finely downy; bracts $\frac{1}{4}$ in., lanceolate-cuspidate. *Calyx* $\frac{1}{6}$ in., clothed with short bristly hairs; teeth setaceous, very long. *Pod* sessile, falcate, $\frac{3}{8}$–$\frac{1}{2}$ in. by $\frac{1}{12}$ in., 4–6-jointed, glabrescent.

42. **D. auricomum,** *Grah. in Wall. Cat.* 5704; annual, stems very slender, leaves all 3-foliolate, racemes very lax few-flowered, pedicels ascending, corolla included. *Benth. Pl. Jungh.* 223; *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 230.

Plains of MARTABAN and TENASSERIM, *Wallich, Helfer, Parish, Kurz.*

Stems cæspitose, diffuse, 1–1½ ft., densely clothed throughout with spreading brown silky hairs. *Leaves* subcoriaceous, pale green, nearly glabrous beneath; end leaflet obovate-oblong, obtuse, ⅜–½ in. long; side ones smaller; petiole ¼ in. *Racemes* terminal, 2–3 in. long, the lower flowers in distant pairs, upper solitary; pedicels ¼–⅜ in.; bracts lanceolate, ¼ in. *Calyx* ⅛ in., shaggy with silky hairs, like those of the stem; teeth linear-setaceous, very long. *Pod* sessile, silky, under ½ by $\frac{1}{12}$ in., 4–5-jointed.

SUBGEN. 7. **Sagotia,** *Walp.* Trailing herbs, with small 3-foliolate stipellate leaves, flowers in sparse lax racemes or 1–2 in the axils of the leaves, deciduous bracts and distinctly jointed pods.

* *Flowers all* 1–3 *together without a common peduncle in the axils of the leaves.*

43. **D. triflorum,** *DC. Prodr.* ii. 334; *Wall. Cat.* 5734 *excl. F. ex parte; Benth. in Mart. Fl. Bras.* xv. 95, t. 26; *Dalz. & Gibs. Bomb. Fl.* 67. D. triflorum β. minus, *W. & A. Prodr.* 229; *Wight Ic.* t. 292. D. heterophyllum, *Wall. Cat.* 5701 C. Hedysarum triflorum, *Linn.*; *Roxb. Hort. Beng.* 57; *Fl. Ind.* iii. 353. H. stipulaceum, *Burm. Fl. Ind.* t. 54, fig. 2. Nicolsonia reptans, *Meissn. in Linn.* xxi. 260. Sagotia triflora, *Walp. & Duch. in Linn.* xxiii. 738.

Everywhere in the plains throughout India, ascending to 4000 ft. in KUMAON and 6–7000 ft. in KASHMIR and on the Chenab.—DISTRIB. Cosmopolitan in tropics.

Stems cæspitose, very slender, trailing ½–1½ ft., copiously branched, clothed with fine spreading hairs. *Stipules* lanceolate, persistent; petiole ⅛–¼ in.; leaflets obovate, ⅛–½ in., truncate or emarginate, with a few adpressed hairs below. *Pedicels* ¼–⅜ in. *Calyx* pubescent, $\frac{1}{12}$–⅛ in.; teeth very long, setaceous. *Pod* ⅜–½ in. long, ⅛ in. br., 3–5-jointed, pubescent; upper suture straight, lower slightly indented.

** *Flowers some racemed, the others pedicelled in the axils of the leaves.*

44. **D. reniforme,** *DC. Prodr.* ii. 327; leaves 1-foliolate, leaflet broader than long, calyx-teeth and pedicels short. *Wall. Cat.* 5702; *W. & A. Prodr.* 230; *Dalz. & Gibs. Bomb. Fl.* 67. Hedysarum reniforme, *Linn. Sp.* 1051; *Burm. Fl. Ind.* t. 52, fig. 1.

EAST HIMALAYAS, *Lobb*; PROME, AVA on the Banks of the Irrawaddi, *Wallich*; WESTERN PENINSULA, *Wight*.—DISTRIB. Java.

Stem 1 ft. or more long, very slender, glabrous. *Leaflet* rigidly subcoriaceous, half as broad again as long., ½–¾ in. long, truncate or emarginate, glabrous; stipules linear, minute, deciduous; petiole ½ in., jointed at the apex. *Racemes* mostly terminal, laxly 10–20-flowered and a few flowers, solitary in the axils of the leaves; bracts linear, minute; pedicels ⅛–⅙ in., finally cernuous. *Calyx* under $\frac{1}{12}$ in., turbinate, glabrous. *Pod* glabrous, ½–¾ in. by ⅛ in.; joints 3–5, longer than broad; upper suture straight, lower little indented.

45. **D. heterophyllum,** *DC. Prodr.* ii. 334; leaves 3-foliolate, calyx-teeth and pedicels elongated. *Wall. Cat.* 5701, *A, B, D.* D. triflorum *a.* majus, *W. & A. Prodr.* 229; *Wight Ic.* t. 291. D. triflorum, *Wall. Cat.* 5734, *F. ex parte.* D. cæspitosum, *DC. Prodr.* ii. 333. Hedysarum heterophyllum, *Willd. Sp. Pl.* iii. 6201. H. reptans, *Roxb. Hort. Beng.* 57; *Fl. Ind.* iii. 354. Dicerma repens, *Grah. in Wall. Cat.* 5740.

EAST HIMALAYAS, tropical zone; KHASIA and ASSAM and along the gulf to PENANG and MALACCA. Plains of PENINSULA and CEYLON.—DISTRIB. Malay isles, China, Philippines, Mascarene isles.

Stems 1–2 ft. long, copiously branched, clothed with dense spreading hairs. *Stipules* ⅛ in., lanceolate-acuminate, persistent; petiole ⅜–½ in., pubescent; leaflets

oblong or obovate-oblong, $\frac{1}{2}$–1 in. long, hairy beneath. *Flowers* solitary or geminate in leaf-axils and up to 6 in copious lax racemes; bracts rather large, lanceolate, deciduous; pedicels $\frac{1}{2}$–$\frac{3}{4}$ in. *Calyx* $\frac{1}{8}$ in., densely hairy; teeth very long, setaceous. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in., long, $\frac{1}{8}$–$\frac{1}{6}$ in. broad, glabrescent; joints 4–5, as broad as long; upper suture straight, lower considerably indented.

*** *Flowers all in lax racemes.*

46. **D. Rottleri,** *Baker, non G. Don*; stipules much shorter than the petiole, calyx-teeth short, joints 1–2, constriction between them very deep. D. præmorsum, *Grah. in Wall. Cat.* 5703? Eleiotis Rottleri, *W. & A. Prodr.* 231. Hedysarum orbiculatum, *Rottler MSS.* Oxydium species, *Bennett Pl. Jav. Rar.* 156. Stylosanthes facie oxalidea, *Wall. Cat.* 5974.

Plains of MYSORE, *Rottler*; PROME, *Wallich.*

Stems 1 ft. or more long, copiously branched, finely downy at first. *Stipules* linear-setaceous, minute; petiole $\frac{1}{2}$–$\frac{3}{4}$ in.; leaflets 3, obovate, $\frac{3}{8}$–$\frac{1}{2}$ in. long and broad, truncate or emarginate, with a few adpressed hairs beneath. *Racemes* copious, axillary and terminal, long-peduncled, laxly 6–8-flowered; bracts boat-shaped, hiding the buds; pedicels $\frac{1}{4}$–$\frac{1}{3}$ in. *Calyx* $\frac{1}{24}$ in., campanulate; teeth subdeltoid. *Joints* $\frac{1}{4}$ in. long, twice as long as broad, the constriction from below reaching nearly to the straight upper suture.

47. **D. parvifolium,** *DC. Prodr.* ii. 334; stipules as long as the petiole, calyx-teeth long setaceous, joints 3–4 with shallow constrictions between them. *Wall. Cat.* 5700; *W. & A. Prodr.* 229. D. scoparium, *Wall. Cat.* 5699. D. microphyllum, *Miq. Fl. Ind. Bat.* i. 239, *an DC?* D. stipulaceum, *Hassk. Pl. Jav. Rar.* 361. Hedysarum tenellum, *Don Prodr.* 243, *non Kunth.*

Everywhere in the plains, from the HIMALAYAS to CEYLON and AVA, ascending to the temperate region, reaching 7000 ft. in KUMAON.—DISTRIB. Malay isles, China, Japan.

Stems densely cæspitose and branched, wide-trailing, at first pubescent. *Stipules* $\frac{1}{8}$ in., linear-setaceous, persistent; leaflets oblong or obovate, pubescent below, often not more than $\frac{1}{8}$–$\frac{1}{4}$ in. long, sometimes $\frac{3}{8}$–$\frac{1}{2}$ in. *Racemes* copious, but usually terminal on the short branches, laxly 6–10-flowered; bracts boat-shaped, deciduous; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in., permanently ascending. *Calyx* $\frac{1}{12}$–$\frac{1}{8}$ in., densely pubescent. *Pod* $\frac{3}{8}$–$\frac{1}{2}$ in. by $\frac{1}{12}$ in., finely downy; joints as broad as long; both sutures distinctly indented.

VAR. *macrocarpum*; pod larger quite $\frac{1}{8}$ in. broad, the sutures less indented, the upper one nearly or quite straight.—Assam and Khasia, *Griffith, Hook. fil. & Thomson.*

SUBGEN. 8. **Pleurolobium,** *DC.* Erect undershrubs, with large leaves, racemose flowers and indistinctly jointed pods dehiscing in a continuous line along the ventral suture.—An aberrant group, which perhaps should be considered a distinct genus.

48. **D. gyrans,** *DC. Prodr.* ii. 326; branches scarcely woody, end leaflet usually 4–6 times as long as broad, pod glabrescent or inconspicuously downy. *Wall. Cat.* 5725; *W. & A. Prodr.* 227; *Wight Ic.* t. 294. Hedysarum gyrans, *Linn.*; *Jacq. Ic.* t. 562; *Roxb. Fl. Ind.* iii. 351. Pseudarthria gyrans, *Hassk. Pl. Jav. Rar.* 391. Codariocalyx gyrans, *Hassk. in Walp. Rep.* ii. 891.

All along the HIMALAYAS from HAZARA to ASSAM, ascending to 7000 ft.; WESTERN PENINSULA, CEYLON, AVA, PEGU, TENASSERIM.—DISTRIB. Malay isles, Philippines.

An undershrub, 3–4 ft. high, with subterete glabrous branches. *Petiole* $\frac{3}{8}$–$\frac{1}{2}$ in.; leaflets 1–3, subcoriaceous, oblong-lanceolate, 3–4 in. long, obtuse, with a little inconspicuous pubescence beneath; side ones, if present, very small, moving by jerks. *Racemes* axillary and terminal, the latter copiously panicled, at first short, the flowers

hidden by the large ovate deciduous bracts, finally 3–6 in. long; pedicels $\frac{1}{4}$ in., patent, finely downy. *Calyx* $\frac{1}{12}$ in., campanulate; teeth deltoid, shorter than the tube. *Corolla* $\frac{1}{4}$ in. *Pod* 1–1$\frac{1}{2}$ in. long, $\frac{1}{6}$–$\frac{1}{5}$ in. broad, falcate, 6–10-jointed, straight along the upper, slightly indented along the lower suture.

VAR. *Roylei*; end-leaflet 3–4 in. long twice as long as broad, corolla rather larger. D. Roylei, *W. & A. Prodr.* 227.

49. **D. gyroides,** *DC. Prodr.* ii. 326; branches woody, end leaflet 2–3 times as long as broad, pod loosely but copiously pubescent. *Wall. Cat.* 5728; *W. & A. Prodr.* 227. D. pseudogyroides, *Miq. Flor. Ind. Bat.* i. 244. Hedysarum gyroides, *Roxb. Hort. Beng.* 57. Codariocalyx gyroides, *Hassk. in Flora,* 1842, *biebl.* ii. 49. C. conicus, *Hassk. in Walp. Rep.* i. 744. Pseudarthria polycarpa, *Hassk. Pl. Jav. Rar.* 393 (*excl. syn.*).

CENTRAL and EAST HIMALAYAS, tropical region; GURWHAL to KHASIA and CACHAR; UPPER BENGAL, PEGU, CEYLON.—DISTRIB. Malay isles.

Closely allied to the last, but decidedly shrubby, reaching 8–10 ft. in height. *Leaves* obtuse, oblong or obovate-oblong, thinly or densely pubescent beneath; side ones often suppressed. *Racemes* shorter and the terminal ones not so copiously panicled; bracts under $\frac{1}{4}$ in. long, narrowed suddenly at the point. *Corolla* $\frac{3}{8}$ in., both standard and keel broader. *Pod* similar, except in vestiture.

51. ABRUS, Linn.

Climbing shrubs. *Leaves* with numerous deciduous leaflets. *Flowers* small, in dense racemes on axillary peduncles or short branches. *Calyx* campanulate, equal; teeth very short. *Corolla* much exserted; standard ovate, acute, adhering below to the staminal tube; wings narrow; keel arcuate. *Stamens* 9, united in a tube slit above, the tenth absent; anthers uniform. *Ovary* subsessile, many-ovuled; style short, incurved, beardless, stigma capitate. *Pod* oblong or linear-oblong, flat or turgid, moderately firm, thinly septate.—DISTRIB. Species 5; cosmopolitan in the tropics.

1. **A. precatorius,** *Linn.*; *DC. Prodr.* ii. 381; branches and leaves beneath glabrous or thinly silky, leaflets ligulate-oblong, pod oblong turgid 3–5-seeded. *Roxb. Fl. Ind.* iii. 258; *Wall. Cat.* 5818; *W. & A. Prodr.* 236; *Dalz. & Gibs. Bomb. Fl.* 76. A. minor and pauciflorus, *Desv. in Ann. Sc. Nat.* ix. 418.—*Rheede Hort. Mal.* viii. t. 39.

HIMALAYAS to CEYLON and SIAM, ascending to 3500 ft.—DISTRIB. Cosmopolitan in the tropics, often planted.

A copiously-branched climber, with slender branches. *Leaves* 2–3 in. long; leaflets 20–40, membranous, deciduous, $\frac{3}{8}$–$\frac{5}{8}$ in. by $\frac{1}{6}$–$\frac{1}{5}$ in. *Racemes* many-flowered, crowded, usually shorter than the leaves. *Calyx* $\frac{1}{12}$ in., thinly silky. *Corolla* reddish or white, 3–4 times the calyx. *Pod* 1–1$\frac{1}{2}$ in. by $\frac{3}{8}$–$\frac{1}{2}$ in. *Seeds* bright scarlet and black, black, or whitish, or mixed black and white, as large as a pea.

2. **A. pulchellus,** *Wall. Cat.* 5819; branchlets and leaves beneath glabrous or thinly silky, leaflets ligulate-oblong, pod linear flat incurved 9–12-seeded. *Thwaites Enum.* 91. A. lævigatus, *E. Meyer*; *Harv. Fl. Cap.* ii. 263. A. melanospermus, *Hassk.*; *Miq. Fl. Ind. Bat.* i. 159. A. acutifolius, *Blume*; *Miq. Fl. Ind. Bat.* i. 160.

KUMAON to CHITTAGONG, TENASSERIM and BIRMA, ascending to 3000 ft. in SIKKIM; CEYLON.—DISTRIB. Malay isles, Guinea, Natal, Kaffraria.

General habit exactly of *A. precatorius*. *Leaves* 3–4 in. long; leaflets 24–30, similar in texture, $\frac{3}{4}$–1$\frac{1}{4}$ in. by $\frac{1}{4}$–$\frac{3}{8}$ in. *Racemes* more numerously flowered, on longer peduncles. *Calyx* and corolla similar. *Pod* incurved, 2–2$\frac{1}{4}$ in. by $\frac{1}{2}$ in., with thinner smooth valves.

3. **A. fruticulosus,** *Wall. Cat.* 5820; branchlets and leaves densely silky, leaflets minute ligulate-linear, pod linear-oblong flattish 4–6-seeded. *W. & A. Prodr.* 236; *Wight Ic.* t. 33.

Forests of MYSORE and the CARNATIC, tropical region.

Branches more slender than in the two others. *Leaves* and leaflets much smaller, the latter 20–50, $\frac{1}{4}$–$\frac{1}{3}$ in. by $\frac{1}{24}$–$\frac{1}{12}$ in., densely silky on both sides, or glabrescent above. *Racemes* few-flowered, exceeding the leaves. *Calyx* $\frac{1}{12}$ in. thinly silky; teeth distinct. *Pod* 1–1$\frac{3}{4}$ in. by $\frac{3}{8}$ in.; valves thin, at first densely silky.

52. CICER, Linn.

Annual herbs. *Leaves* pinnate, rigid; leaflets and stipules strongly veined, deeply toothed. *Flowers* solitary in the axils of the leaves. *Calyx-tube* oblique; teeth lanceolate, subequal. *Corolla* exserted; standard broad, exceeding the wings and keel. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, 2 or many-ovuled; style incurved beardless, stigma capitate. *Pod* sessile, oblong, turgid, narrowed into the persistent style.—DISTRIB. Species 7, Mediterranean and West and Central Asian, one widely cultivated.

1. **C. arietinum,** *Linn.*; *DC. Prodr.* ii. 354; leaflets close oblanceolate or oblong, corolla scarcely half as long again as the calyx, pubescence of pod short and fine. *Roxb. Fl. Ind.* iii. 324; *Wall. Cat.* 5949; *W. & A. Prodr.* 235; *Wight Ic.* t. 20; *Bot. Mag.* t. 2274; *Boiss. Fl. Orient.* ii. 560.

Commonly cultivated in the northern provinces and Nilghiris.—DISTRIB. Cultivated in various temperate and tropical countries.

A viscose much-branched annual. *Leaves* 1–2 in., with usually a terminal leaflet; stipules small, with a few long teeth. *Peduncle* $\frac{1}{2}$–$\frac{3}{4}$ in. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in.; teeth linear, 2–3 times the tube. *Pod* oblong, $\frac{3}{4}$–1 in.

2. **C. soongaricum,** *Steph.*; *DC. Prodr.* ii. 354; leaflets lax obovate-cuneate, corolla twice the calyx, pubescence of pod dense. *Jaub. & Spach Ill. Pl. Or.* t. 43 B. C. microphyllum, *Benth. in Royle Ill.* 200. C. Jacquemontii, *Jaub. & Spach in Ann. Sc. Nat.* ii. 18, 231; *Boiss. Fl. Orient.* ii. 563.

WESTERN HIMALAYAS, temperate and alpine region, alt. 9–15,000 ft.; PITI, LAHUL, KUMAON, TIBET, &c.—DISTRIB. Orient, Afghanistan, Songaria.

A very diffuse annual, with wiry finely pubescent or subglabrous stems. *Leaves* 3–4 in. long, ending in a spiral tendril; leaflets in 10–12 pairs, growing gradually smaller upwards, subcoriaceous, strongly veined; stipules $\frac{3}{8}$–$\frac{1}{2}$ in., deeply sharply palmatifid. *Pedicels* 1$\frac{1}{2}$ in., with a large bract at the curve. *Calyx* very gibbous, $\frac{3}{8}$ in.; teeth lanceolate, 2–3 times the tube. *Pod* linear-oblong, 1 in. long.

53. VICIA, Linn.

Annual or perennial herbs. *Leaves* equally pinnate, ending in twisted tendrils. *Flowers* subsessile, or in peduncled racemes in the axils of the leaves. *Calyx-tube* campanulate, often oblique; teeth long, often unequal. *Corolla* more or less exserted; standard broad; keel shorter than the wings. *Stamens* diadelphous, the mouth of the sheath very oblique; anthers uniform. *Ovary* nearly sessile, 2- or many-ovuled; style short, filiform or slightly flattened, stigma capitate. *Pod* flattish, continuous within.—DISTRIB. Species 180, spread principally through the north temperate zone.

SUBGEN. 1. **Ervum,** Linn. ex parte. Annuals, with flowers in sparse peduncled racemes, rarely solitary. *Style* finely downy all round near the tip.

1. **V. tetrasperma,** *Moench Meth.* 148; stems glabrous, peduncles 1-2-flowered, pods glabrous 3–4-seeded. *Boiss. Fl. Orient.* ii. 596. Ervum tetraspermum, *Linn.*; *DC. Prodr.* ii. 367.

NORTH-WEST HIMALAYAS, temperate region, rare; KUMAON, &c.—*Thomson, Edgeworth*, &c.—DISTRIB. Europe, Orient, &c.

Stems very slender, copiously branched. *Leaves* about 1 in. long; leaflets 3–4 pairs, obtuse or acute, $\frac{1}{2}$–$\frac{3}{4}$ in. long. *Flowers* on copious axillary peduncles about as long as the leaves. *Calyx* $\frac{1}{12}$ in. *Corolla* lilac, distinctly exserted. *Pod* linear-oblong, $\frac{1}{2}$ in.

2. **V. hirsuta,** *Koch Synops.* 191; stems pubescent, peduncles 3–6-flowered, pods hairy 2-seeded. *Boiss. Fl. Orient.* ii. 595. Ervum hirsutum, *Linn.*; *W. & A. Prodr.* 235; *Roxb. Fl. Ind.* iii. 323. E. filiforme, *Roxb. in Wall. Cat.* 5955. E. Lens, *Wall. Cat.* 5954 C.

NORTH-WEST PROVINCES, from the PUNJAB to NIPAL, in the tropical and temperate region, frequent in cultivated grounds, ascending to 6000 ft.; NILGHIRIS.—DISTRIB. Europe, Orient, &c.

Stems rather stronger than in the last. *Leaves* longer, ending in an intricate tendril; leaflets 5–8 pairs, $\frac{1}{2}$–1 in., truncate. *Peduncles* shorter than the leaves. *Corolla* smaller, scarcely exserted from the calyx. *Pod* $\frac{1}{4}$–$\frac{3}{8}$ in. long, oblique, more turgid, finally black.

SUBGEN. 2. **Cracca.** Perennials with numerous flowers in peduncled racemes. *Style* finely downy all round near the tip.

3. **V. tenera,** *Grah. in Wall. Cat.* 5928; leaflets 12–16 distant narrow ligulate, racemes laxly many-flowered as long as their peduncles, lower calyx-teeth linear-subulate, corolla small pale. *Benth. in Royle Ill.* 200.

WESTERN HIMALAYAS; SIMLA, GURWHAL, KUMAON, alt. 3–8000 ft.; SILHET, *Wallich*.

A slender straggling subglabrous climber. *Leaves* 2–3 in. long; leaflets membranous, $\frac{3}{4}$–1 in. by $\frac{1}{12}$–$\frac{1}{8}$ in. broad, acute, finely silky beneath; stipules small, deeply toothed. *Racemes* 6–20-flowered, 1–2 in. long. *Calyx* $\frac{1}{12}$ in., subglabrous; teeth very unequal, upper deltoid. *Corolla* $\frac{3}{8}$ in. *Pod* oblique, linear, glabrous, rostrate, 1$\frac{1}{4}$ in. long, 6–8-seeded.

4. **V. tenuifolia,** *Roth*; *DC. Prodr.* ii. 358; leaflets 20–24 narrow ligulate distant, racemes 20–40-flowered elongated long-peduncled, lower calyx-teeth lanceolate, corolla middle-sized deep blue. *Boiss. Fl. Orient.* ii. 586. V. Cracca, *Benth. in Royle Ill.* 200, *not Linn.*

NORTH-WEST HIMALAYAS, temperate region; Chenab valley, 6–8000 ft., *Thomson*. WEST TIBET, *Falconer*. —DISTRIB. Europe.

A subglabrous climber, a yard or more high. *Leaves* 4–6 in. long; leaflets acute, membranous, silky beneath, 1$\frac{1}{4}$–1$\frac{1}{2}$ in. long; stipules linear, with a single tooth. *Racemes* copious, reaching, as do the peduncles, $\frac{1}{2}$ ft. long. *Calyx* subglabrous, $\frac{1}{6}$ in.; teeth very unequal, all shorter than the tube, upper deltoid. *Corolla* $\frac{1}{2}$–$\frac{5}{8}$ in. *Pod* 1 in. long, with a stalk as long as the calyx-tube.

5. **V. mollis,** *Benth. MSS.*; leaflets 16–20 close narrow ligulate, racemes few-flowered close short-peduncled, lower calyx-teeth linear, corolla large yellowish.

Valley of the Kishengunga, *Winterbottom*.

A suberect perennial, with the habit of *V. sepium*, with stems clothed with fine spreading hairs. *Leaves* 1$\frac{1}{2}$–2 in. long; leaflets $\frac{1}{2}$–$\frac{5}{8}$ in. long, obtuse, clothed on both surface with adpressed, silky hairs; stipules broad, subentire. *Racemes* from the upper axils only, secund, an inch long. *Calyx* $\frac{1}{4}$ in., densely silky; teeth all linear, lower as long as the tube, upper shorter. *Corolla* nearly 1 in. long.

6. **V. pallida,** *Turcz.*; *Led. Fl. Ross.* i. 673; leaflets 16–24 distant linear-oblong membranous, racemes long-peduncled laxly many-flowered, lower calyx-teeth deltoid-cuspidate, corolla pale lilac middle-sized. V. sylvatica, *Benth. in Royle Ill.* 200, *not Linn.*

WEST HIMALAYAS, temperate region; KASHMIR to KUMAON, 4–9000 ft.—DISTRIB. Siberia.

A tall straggling glabrous climber, with the habit of *V. sylvatica.* *Leaves* 2–4 in. long, ending in tendrils; leaflets obtuse, $\frac{1}{4}$–$\frac{3}{4}$ in., the upper growing gradually shorter; stipules small, narrow, deeply toothed. *Racemes* 12–20-flowered, on peduncles 1–4 in. long. *Calyx* $\frac{1}{8}$ in., glabrous, membranous; all the teeth much shorter than the tube. *Corolla* $\frac{1}{2}$ in. *Pod* 1–1$\frac{1}{2}$ in. long, flat, glabrous, oblique, distinctly-stalked, 5–6-seeded.

7. **V. Griffithii,** *Baker*; leaflets 12–16 distant linear-oblong membranous, racemes peduncled laxly 2–4-flowered, lower calyx-teeth lanceolate, corolla lilac middle-sized.

PUNJAB, at Rawul Pindee and Futteyjung, *Dr. Aitchison.*—DISTRIB. Afghanistan, *Griffith*, 1114.

A straggling annual, 1–2 ft. high, with slender stems, finely silky at first, soon glabrescent. *Leaves* about 2 inches long; leaflets obtuse, scattered, $\frac{1}{8}$–$\frac{1}{4}$ in. broad, obscurely silky; stipules deltoid, deeply palmately laciniated. *Racemes* about as long as the leaves. *Calyx* $\frac{1}{6}$ in. long, rather silky, the lower teeth half as long as the tube, the upper deltoid. *Corolla* more than $\frac{1}{2}$ in. *Pod* above 1 in. long, oblong, flat, glabrous, veined, 5–6-seeded.

8. **V. rigidula,** *Royle Ill.* 200; leaflets 10–12 subdistant oblong venose, racemes 6–20-flowered close long-peduncled, calyx-teeth all very short, corolla large reddish. Lathyrus himalensis, *Camb. in Jacquem. Voy. Bot.* i. 44, t. 53. V. dumetorum, *Benth. in Royle Ill.* 200?

West Himalayas, temperate region; KASHMIR to KUMAON, 7–9000 ft.

A subglabrous or finely downy climber, 2–3 ft. high. *Leaves* 2–3 in. long, ending in intricate tendrils; leaflets obtuse, $\frac{3}{4}$–1 in. long, firmer in texture than in the others, finely silky beneath, with veins raised like those of a *Tephrosia*; stipules small, half-hastate, deeply-toothed. *Peduncles* 2–3 in. long. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., glabrous; pedicels longer than in the others, fully $\frac{1}{8}$ in. *Corolla* 3–4 times the length of the calyx. *Pod* linear, glabrous, on a stalk nearly as long as the calyx, 5–6-seeded.

SUBGEN. 3. **Euvicia.** Annuals or perennials, with the style conspicuously bearded on the lower side at the tip.

9. **V. sativa,** *Linn; DC. Prodr.* ii. 360; annual, leaflets multijugate of upper leaves ligulate, flowers solitary or geminate not racemed. *Roxb. Fl. Ind.* iii. 323; *Wall. Cat.* 5957; *Boiss. Fl. Orient.* ii. 574.

NORTH-WEST PROVINCES, ascending from the plains of BENGAL to 7500 ft. in KUMAON, probably always cultivated.

Stems slender, suberect, glabrous or obscurely downy. *Leaflets* 8–12, of upper leaves $\frac{3}{4}$–1 in. long, of lower shorter, broader; stipules small, obliquely lanceolate, deeply toothed. *Calyx* $\frac{3}{8}$ in.; teeth lanceolate-subulate. *Corolla* red-blue, twice the calyx. *Pod* glabrescent, 1$\frac{1}{2}$–2 in. long, 8–10-seeded.

VAR. *angustifolia*, *Roth* (Sp.), dwarfer, diffuse, leaflets shorter of lower leaves deeply emarginate at apex, flowers and pod smaller. *Boiss. Fl. Orient.* ii. 574. V. Bobartii, *Forst. in Linn. Trans.* xvi. 442. V. pallida, *Jacquem. MSS.* (*a yellow flowered form*). Plains of the north-west, a native.—Distrib. Europe, Orient.

10. **V. peregrina,** *Linn.*; *DC. Prodr.* ii. 362; annual, leaflets multijugate ligulate, flowers solitary. *Boiss. Fl. Orient.* ii. 576.

Plains of PUNJAB, *Aitchison*.—DISTRIB. Europe, Orient.

Stems slender, glabrous, diffuse. *Leaflets* 10–12, alternate or opposite, ½–1 in. long; stipules minute, bifid, with linear divisions. *Flowers* solitary, on short pedicels in the axils of the leaves. *Calyx* ¼ in.; teeth lanceolate, the upper shorter, curved upwards. *Corolla* purplish-red, twice the calyx. *Pod* linear-oblong, deflexed, glabrescent, rather recurved, 1–1¼ in. long, 5–6-seeded.

11. **V. sepium,** *Linn.*; *DC. Prodr.* ii. 364; perennial, leaflets multijugate oblong, racemes subsessile 2–6-flowered. *Boiss. Fl. Orient.* ii. 568.

KASHMIR, temperate region.—DISTRIB. Europe, Orient, Siberia.

Stems finely downy, suberect, 1–2 ft. *Stipules* small, deeply toothed; leaflets 10–12, membranous, truncate, ½–1 in. long. *Racemes* very close, secund, confined to the axils of the upper leaves. *Calyx* ⅓ in., glabrous or downy; teeth deltoid-cuspidate, much shorter than the tube. *Corolla* reddish, twice the calyx. *Pod* linear-oblong, oblique, rostrate, glabrous, 1 in. long, 6–10-seeded.

12. **V. narbonensis,** *Linn.*; *DC. Prodr.* ii. 364; leaflets large of lowest leaves 2 of upper 4–6 obovate, racemes subsessile 2–6-flowered. *Boiss. Fl. Orient.* ii. 568.

PUNJAB, near Peshawur, *Vicary*, perhaps introduced.—DISTRIB. S. Europe, Orient, probably the original of the cultivated Bean.

A stout suberect annual, 1–1½ foot high, glabrous or finely downy. *Stipules* large, deeply toothed; leaflets 1–2 in. long, entire in our plant. *Calyx* ⅜ in.; lower teeth lanceolate, as long as tube; upper deltoid. *Corolla* purple, more than twice the calyx. *Pod* 1½–2 in. long, downy, 6–7-seeded.

ERVUM LENS, *Linn.*; *Wall. Cat.* 5954 (Cicer Lens, Willd.; Roxb. Fl. Ind. iii. 324) the common Lentil, and VICIA FABA, *Linn.*; *Roxb. Fl. Ind.* iii. 323; *Wall. Cat.* 5951, the Bean, are commonly cultivated, especially in the North-West Provinces.

VICIA BENGHALENSIS, *Linn.* seems to be the Mediterranean *V. atropurpurea*, Desf., and to have no claim to be regarded as an Indian plant.

54. LATHYRUS, *Linn.*

Annual or perennial herbs, with equally pinnate leaves, ending in a tendril or bristle. *Flowers* racemed or solitary. *Calyx-tube* campanulate, oblique; teeth long or upper short. *Corolla* more or less exserted; standard broad; keel shorter than the wings. *Stamens* diadelphous, the mouth of the tube not oblique; anthers uniform. *Ovary* subsessile or stalked, many-ovuled; style flattened, bearded on the inner side, stigma capitate. *Pod* terete or flattish, continuous within.—DISTRIB. Species described 170, spread principally through all the north temperate zone.

SUBGEN. 1. **Eulathyrus.** Petiole terminated by a long tendril.

1. **L. Aphaca,** *Linn.*; *DC. Prodr.* ii. 372; annual, leaflets abortive, flowers 1–2 on a long peduncle. *Roxb. Fl. Ind.* iii. 322; *Wall. Cat.* 5952; *Benth. in Royle Ill.* 200; *Boiss. Fl. Orient.* ii. 602.

Spread through the northern provinces, ascending from the plains of BENGAL to the temperate zone in HAZARA, KASHMIR and KUMAON.—DISTRIB. Europe, Orient, Abyssinia.

Stems slender, wingless, much branched. *Stipules* in pairs adpressed to the stem, leaf-like, entire, truncate, hastate. *Peduncle* 2–3 times the stipule. *Calyx* ¼ in.; teeth equal, lanceolate, exceeding the tube. *Corolla* yellow, twice the calyx. *Pod* linear-oblong, wingless, 4–6-seeded.

2. **L. sativus,** *Linn.*; *DC. Prodr.* ii. 373; annual, stems winged, leaflets

2 linear or lanceolate, flowers solitary, pods oblong winged on the back. *Roxb. Fl. Ind.* iii. 321; *Wall. Cat.* 5953; *Benth. in Royle Ill.* 200; *Boiss. Fl. Orient.* ii. 606.

Spread through the northern provinces, ascending from the plains of BENGAL to 4000 ft. in KUMAON. Often cultivated.—DISTRIB. Europe, Orient, Trop. Africa.

Glabrous, much branched. *Stipules* broad, entire; petiole winged; leaflets $\frac{1}{8}$–$\frac{1}{6}$ in. broad. *Peduncle* rather longer than the petiole. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in.; teeth lanceolate, subequal, twice the tube. *Corolla* $\frac{3}{4}$ in., red, bluish or white. *Pod* 1$\frac{1}{2}$ in., long, glabrous, 4–5-seeded, the dorsal suture with a narrow spreading wing on each side.

The allied *L. tingitanus*, Linn., also much cultivated, with oblong leaflets and a linear many-seeded pod, is included in the set of Nilghiri plants distributed by Hohenacker, but has no claim to be considered a native.

3. **L. sphæricus,** *Retz.*; *DC. Prodr.* ii. 372; annual, stems wingless, leaflets 2 narrow-linear, flowers solitary, pods linear wingless many-seeded. *Boiss. Fl. Orient.* ii. 613. L. angulatus, *Benth. in Royle Ill.* 200.

North-West Provinces, ascending from BUNDELKUND and the PUNJAB to 5500 ft. in KUMAON.—DISTRIB. Europe, Orient, Abyssinia.

Stems glabrous, very slender, very copiously branched. *Stipules* linear, caudate; petiole $\frac{1}{4}$–$\frac{1}{2}$ in., winged; leaflets very narrow, reaching 3 in. long. *Peduncle* shorter than or a little exceeding the petiole, with a conspicuous linear bracteole. *Calyx* under $\frac{1}{2}$ in.; teeth equal, as long as the tube. *Corolla* reddish, twice the calyx. *Pod* 2 in. long, 10–12-seeded.

4. **L. pratensis,** *Linn.*; *DC. Prodr.* ii. 370; perennial, leaflets 2 lanceolate, flowers many in long-peduncled racemes, calyx-teeth subequal. *Benth. in Royle Ill.* 200; *Boiss. Fl. Orient.* ii. 615.

WEST HIMALAYAS, temperate zone, alt. 6–8000 ft.; KASHMIR, GURWHAL, SIMLA.—DISTRIB. Europe, Orient, Abyssinia.

Stems slender, wingless, very diffuse. *Stipules* large, lanceolate-caudate; petiole distinct, angular. *Peduncles* often much exceeding the leaves. *Calyx* $\frac{1}{4}$ in.; teeth all linear, as long as the calyx. *Corolla* yellow, 3 times the calyx. *Pod* linear. *L. cashmericus*, Royle MSS., is a form with pubescent stems and calyx.

5. **L. altaicus,** *Led. Fl. Alt.* iii. 355; perennial, leaflets 6–8 oblong, flowers few in long-peduncled racemes, calyx-teeth very unequal. *Led. Ic. Pl. Ross.* t. 53. L. ovatus, *Royle Ill.* 200.

WEST HIMALAYAS, temperate region; Baltal and Chenab valley, 6–8000 ft., *Royle, Thomson, Jacquemont.*—DISTRIB. Siberia.

A suberect glabrous perennial, $\frac{1}{2}$–1 ft. high. *Leaves* 2–3 in. long; leaflets glaucous, membranous, venose, $\frac{1}{2}$–$\frac{3}{4}$ in. broad; stipules lanceolate-caudate slightly toothed. *Racemes* secund, laxly 3–6-flowered; peduncles 2–4 in. long. *Calyx* $\frac{3}{8}$ in.; lower teeth linear, nearly as long as the tube; upper deltoid. *Corolla* reddish, twice the calyx.

SUBGEN. 2. **Orobus,** *Linn.* Petiole terminated by a mere bristle.

6. **L. inconspicuus,** *Linn.*; *DC. Prodr.* ii. 372; annual, leaflets 1–2 narrow linear, flowers solitary subsessile in the axils of the leaves. L. erectus, *Lag.*; *Boiss. Fl. Orient.* ii. 613.

KASHMIR, 4–5000 ft., *Thomson, Falconer.* SCINDE, *Stocks.*

Habit of *L. sphæricus*, with which it coincides in stem, leaflets, pod and stipules. *Petiole* very short, not winged; leaflets 1–1$\frac{1}{2}$ in. long. *Calyx* $\frac{1}{6}$ in.; teeth subequal, lanceolate-subulate, as long as the tube. *Corolla* lilac, twice the calyx.

7. **L. luteus,** *Baker*; perennial, leaflets 6–8 oblong, flowers in peduncled racemes. Orobus luteus, *Linn.*; *DC. Prodr.* ii. 378. O. lævigatus, *W. & K. Pl.*

Hung. t. 243. O. orientalis, *Boiss. Diag.* ix. 106. O. Emodi, *Wall. Cat.* 5948. O. aureus, *Stev.*; *Boiss. Fl. Orient.* ii. 621.

West Himalayas, tropical and temperate zone, ascending from the salt range in the PUNJAB to 8500 ft. in KUMAON and 10,000 ft. in KHAGAN.—DISTRIB. Europe, Orient, Altai, Songaria.

Stems suberect, glabrous, 2–3 ft. high. *Stipules* large, leafy; leaflets membranous, acute, 2–4 in. long. *Racemes* 6–12-flowered, equalling or exceeding the leaves. *Calyx* $\frac{1}{3}$–$\frac{1}{2}$ in.; lower teeth lanceolate, upper deltoid. *Corolla* bright yellow, twice the calyx. *Pod* linear, beaked, 2–3 in. long.

The genus PISUM is principally distinguished from *Lathyrus* by its thick laterally compressed style. The two subspecies of the common cultivated Pea are both often cultivated in the northern provinces; P. SATIVUM, *Linn.*; *Roxb. Fl. Ind.* iii. 321; *Wall. Cat.* 5950, with round seeds of uniform colour and 4–6 leaflets; and P. ARVENSE, *Linn.*, with compressed marbled seeds and 2–4 leaflets. Royle considers the latter a true native.

55. AMPHICARPÆA, Elliott.

Wide-twining herbs, with 3-foliolate stipellate leaves and persistent striated stipules and bracts. *Flowers* with a strong tendency to dimorphism, those that bear the fully developed pods being, as in Viola, without petals. *Calyx-tube* long, equal, teeth distinct, unequal. *Corolla* much exserted; petals equal in length; standard and wings with a distinct spur on each side of the claw. *Stamens* diadelphous; anthers uniform. *Ovary* obscurely stalked, many-ovuled; style filiform, inflexed, beardless, stigma capitate. *Pod* flat, linear-oblong.—DISTRIB. Species 3, or 3 varieties of one, from the United States, Japan, and Himalayas, one in each country.

1. **A. Edgeworthii,** *Benth. Pl. Jungh.* 231.

WEST HIMALAYAS, temperate zone; Simla, 5–6000 ft., *Edgeworth, Thomson.*

Stems very slender, thinly shortly pubescent. *Stipules* and bracts oblong or lanceolate, subobtuse or subacute, $\frac{1}{8}$ in. long; leaflets membranous, obscurely hairy; end one broad ovate acute, side ones oblique. *Flowers* usually solitary or in pairs, but casually racemed; pedicels very short. *Calyx* $\frac{1}{8}$ in.; teeth lanceolate-subulate, much shorter than the tube. *Corolla* $\frac{1}{2}$ in., reddish. Perfect *pod* 1 in. long, linear, recurved, 2–3-seeded. Very near the Japanese species (*Shuteria trisperma*, Miq. Ann. 25177
Mus. Lug. Bat. iii. 51) and the well-known American *A. monoica*, both of which have obovate bracts and copiously racemed flowers.

56. SHUTERIA, W. & A.

Climbers, with 3-foliolate stipellate leaves, persistent bracts and bracteoles, and middle-sized racemose uniform flowers. *Calyx-tube* gibbous; teeth distinct, shorter than the tube. *Corolla* exserted; exauriculate standard rather exceeding the keel and distinctly spurred wings. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, many-ovuled; style incurved, filiform, beardless, stigma capitate. *Pod* flat, linear, recurved.—DISTRIB. One additional species, Trop. African.

1. **S. vestita,** *W. & A. Prodr.* 207; stems densely hairy, racemes dense sessile many-flowered, bracts and bracteoles conspicuous lanceolate, leaflets obovate-oblong or roundish obtuse. *Benth. Pl. Jungh.* 232; *Wight Ic.* t. 165; *Dalz. & Gibs. Bomb. Fl.* 68. Glycine vestita, *Grah. in Wall. Cat.* 5512. G. involucrata, *Wall. Cat.* 5506 A, *ex parte.*

EAST HIMALAYAS; KHASIA, SIKKIM, BHOTAN and MISHMI, ascending to 5000 ft. Hills of WESTERN PENINSULA and CEYLON, ascending to 7000 ft.

Stems slender, woody, glabrescent. *Stipules* lanceolate, rigid, under ¼ in.; petiole 1–3 in., hairy or glabrous; leaflets membranous or subcoriaceous, obscurely hairy on both sides or glabrescent, the end one 1–2 in. long. *Racemes* copious, close, 1–4 in. long, sometimes 2–3 from same node; lower flowers often geminate; bracts rigid, about as long as the densely hairy pedicels. *Calyx* ⅙ in., densely hairy; teeth shorter than tube, upper lanceolate-cuspidate. *Corolla* reddish, twice the calyx. *Pod* 1–1¼ in. long, linear, hairy, recurved, 5–6-seeded.

66245 VAR. 1. *glabrata*; calyx and leaves nearly or quite glabrescent. S. glabrata, *W. & A. Prodr.* 207.—Khasia, *Simons.* Nilghiris, *Wight.*

VAR. 2. *involucrata*; racemes laxer, their lower nodes bracteated by 2–3 reduced roundish leaflets ¼–½ in. long, leaflets obovate-oblong, calyx silky. S. involucrata, *W. & A. Prodr.* 207; *Benth. Pl. Jungh.* 232. Glycine involucrata, *Wall. Pl. As. Rar.* iii. 22, t. 241; *Wall. Cat.* 5506, *ex parte.*—Kumaon, Gurwhal, Nipal.

VAR. 3. *densiflora*; racemes very dense, the flowers often several from the same node, bracts and bracteoles rather larger, calyx pod and oblong subcoriaceous leaflets glabrous. S. densiflora, *Benth. Pl. Jungh.* 232. Glycine involucrata, *Wall. Cat.*, 5506, *ex parte.*—Gurwhal, Kumaon and Nipal, ascending to 7000 ft.

54558 2. **S. hirsuta,** *Baker*; stems densely hairy, racemes peduncled many-flowered, bracts and bracteoles long linear-setaceous, leaflets ovate cuspidate.

KHASIA and SIKKIM, 3–5000 ft., *Hook. fil. & Thomson.*

Stems firm, slender, densely clothed with conspicuous deflexed hairs. *Stipules* ¼–½ in.; leaflets membranous, with a thin coating of adpressed hairs on both sides, subconcolorous; end one 2–4 in. long. *Flowers* in lax racemes, 2–3 in. long, on densely hairy peduncles as long as themselves, geminate at the nodes; bracts ¼–⅓ in. *Calyx* ⅙–⅕ in., thinly hairy; teeth shorter than tube, upper deltoid, lower linear. *Corolla* purple, twice the calyx. *Pod* recurved, densely hairy, many-seeded.

3. **S.? ferruginea,** *Baker*; stems densely hairy, racemes peduncled many-flowered, bracts and bracteoles lanceolate conspicuous, leaflets ovate-cuspidate. Amphicarpæa ferruginea, *Benth. Pl. Jungh.* 231. Glycine ferruginea, *Grah. in Wall. Cat.* 5514. G. cylindriflora, *Wall. Cat.* 5516.

NIPAL, *Wallich.*

Stems slender, woody. *Stipules* and bracts less persistent than in the other species; petiole 2–3 in.; leaflets membranous, green, with inconspicuous adpressed hairs above, glaucous-grey with dense hairs below, ferruginous on the nerves; end one 2–3 in. long. *Flowers* 6–12 together, in short-peduncled racemes. *Calyx* under ¼ in., subglabrous; upper teeth deltoid, lower lanceolate. *Corolla* ½–⅝ in., reddish.—Recedes to *Glycine* by its subcaducous bracts and bracteoles.

4. **S. suffulta,** *Benth. Pl. Jungh.* 232; stems glabrous, racemes very lax few-flowered, bracts and bracteoles linear very minute, leaflets obtuse roundish. Glycine suffulta, *Wall. Cat.* 5507.

BIRMA; Prome hills and Taong Dong, *Wallich.* TENASSERIM, *Helfer.*

Stems firm, very slender. *Stipules* linear, ⅛ in.; leaflets membranous, subglabrous, glaucous-grey beneath, the end one ¾–1 in. long. *Racemes* nearly sessile, 1–2 in. long, 6–10-flowered, the lower nodes bracteated by reduced leaves as in *S. vestita, var involucrata*; bracts rigid, not more than $\frac{1}{24}$ in. long; pedicels distant, solitary, very short. *Calyx* ⅙ in., with a few adpressed hairs; teeth all short, lowest lanceolate. *Corolla* ⅜ in., reddish. *Pod* 1½ in. long, glabrous, recurved, 6–8-seeded.

57. DUMASIA, DC.

Climbing herbs. *Leaves* 3-foliolate, with stipellate leaflets. *Flowers* middle-sized, racemose. *Calyx-tube* cylindrical, very gibbous, with a very oblique subtruncate mouth. *Corolla* exserted; petals equal in length; standard spurred on

both sides of the base of the limb; wings and keel adherent, with small blades and very long claws. *Stamens* diadelphous; anthers uniform. *Ovary* linear, substipitate, few-ovuled; style long, flattened above its curve, stigma capitate. *Pod* linear, falcate, torulose.—DISTRIB. One other species, in Japan.

1. **D. villosa,** *DC. Mem. Leg.* 257, t. 44; *Prodr.* ii. 241; leaves and leaflets distinctly petioled, the latter ovate, corolla twice as long as the calyx. *Wall. Cat.* 5523. D. pubescens, *DC. loc. cit.* t. 45. D. congesta, *Grah. in Wall. Cat.* 5524; *W. & A. Prodr.* 206; *Wight Ic.* t. 445.

HIMALAYAS, from SIMLA and KUMAON to SIKKIM and KHASIA, ascending to 6-7000 ft. Hills of WESTERN PENINSULA and CEYLON.—DISTRIB. Java, Madagascar, Natal.

Stems slender, densely clothed with grey or ferruginous hairs. *Petiole* 1–2 in.; stipules minute, setaceous; leaflets membranous, obtuse, green, with a few obscure hairs above, grey, densely pubescent beneath; end one 2–3 in. long. *Racemes* 2–6 in. long, lax or close, 12–40-flowered, rarely (*D. congesta,* Grah.) close, subsessile; bracts and bracteoles minute, setaceous. *Calyx* $\frac{1}{4}$–$\frac{3}{8}$ in., with a few adpressed hairs. *Corolla* $\frac{1}{2}$–$\frac{3}{4}$ in., yellow or purplish. *Pod* $1\frac{1}{2}$ in. long, velvety, 3–4-seeded.

VAR. *leiocarpa,* Benth. Pl. Jungh. 231, sp.; pod and leaflets subglabrous.—Sikkim, Khasia, Ceylon.

2. **D. cordifolia,** *Benth. MSS.*; leaves and leaflets subsessile, the latter rotundato-cordate, corolla half as long again as the calyx.

KHASIA, 5000 ft., *Hook. fil. & Thomson.*

Stems very slender, at first finely downy. *Stipules* linear, very minute; leaflets membranous, glabrous, $\frac{1}{2}$–1 in. long, firm, pale green. *Flowers* 6–10, in a close raceme, on a glabrous peduncle 1–$2\frac{1}{2}$ in. long; bracts and bracteoles linear, very minute. *Calyx* glabrous, membranous, $\frac{1}{4}$–$\frac{1}{3}$ in. long. *Corolla* pale yellow.

58. GLYCINE, Linn.

Twining or suberect herbs. *Leaves* with 3–7 stipellate leaflets. *Flowers* in axillary racemes, with minute narrow bracts. *Calyx-tube* campanulate; teeth distinct, long or short. *Corolla* mostly little exserted; petals about equal in length; standard not distinctly spurred. *Stamens* more or less completely monadelphous; anthers uniform. *Ovary* subsessile, many-ovuled; style short, incurved, beardless, stigma capitate. *Pod* linear or linear-oblong, straight or recurved, flat or rather turgid, few-seeded.—DISTRIB. Species about 12, spread through tropics of old world, and especially Australia.

1. **G. javanica,** *Linn.*; *DC. Prodr.* ii. 242; stems slender twining, leaflets 3, racemes elongated many-flowered, calyx-teeth long setaceous, pod narrow small. *Benth. in Journ. Linn. Soc.* viii. 266. Soja Wightii and S. javanica, *Grah. in Wall. Cat.* 5530 & 5528. Notonia Wightii, *W. & A. Prodr.* 208. Johnia Wightii, *W. & A. Prodr.* 449.

Plains of the WESTERN PENINSULA and CEYLON.—DISTRIB. Trop. Africa, Natal, Java.

Stems wide-climbing, more or less clothed with grey or ferruginous silky hairs. *Petioles* 1–3 in.; leaflets membranous, green, with a few adpressed hairs above, grey and pubescent below; end one ovate, acute, 2–4 in. long. *Racemes* short-peduncled, dense or lax, 1–6 in. long; pedicels very short; bracteoles long, setaceous. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., densely silky; teeth setaceous, plumose. *Corolla* reddish, little exserted. *Pod* linear, straight, 1 in. by $\frac{1}{6}$–$\frac{1}{5}$ in., 4–5-seeded, clothed with adpressed hairs.

2. **G. pentaphylla,** *Dalz. in Kew Journ.* iv. 344; stems slender twining, leaflets 5–7, racemes elongated many-flowered, calyx-teeth short, pod broad. *Benth. in Journ. Linn. Soc.* viii. 266; *Dalz. & Gibs. Bomb. Fl.* 68.

KHASIA, 3–5000 ft., *Hook. fil. & Thomson, Lobb.* CONCAN, *Dalzell, Stocks.*

Stems wide-climbing, with a few adpressed hairs. *Petiole* 1–2 in.; leaflets subcoriaceous, with a few adpressed hairs on both sides, green above, grey below, distant; end one oblong-lanceolate, acute, 3–4 in. long. *Racemes* lax, usually short-peduncled, reaching 6–8 in. long; pedicels very short, fascicled. *Calyx* $\frac{1}{12}$ in.; teeth deltoid, shorter than the tube. *Corolla* reddish, twice the calyx. *Pod* glabrous, flat, rather recurved, $1\frac{1}{2}$ in. by $\frac{1}{3}$ in., 4–5-seeded.

3. **G. Soja,** *Sieb. & Zucc. Fam. Nat. Fl. Jap.* 11; stems stout suberect, leaflets 3, racemes few-flowered congested sessile, calyx-teeth long setaceous, pods broad. *Benth. in Journ. Linn. Soc.* viii. 266. Soja hispida, *Moench*; *DC. Prodr.* ii. 396; *Wall. Cat.* 5529; *W. & A. Prodr.* 247. Dolichos Soja, *Linn.*; *Roxb. Fl. Ind.* iii. 314. Soja angustifolia, *Miq. Fl. Ind. Bat.* i. 223.

HIMALAYAS, tropical region; KUMAON to SIKKIM, KHASIA and AVA, often cultivated.—DISTRIB. East Asia.

Stems suberect or climbing upwards, annual, densely clothed with fine ferruginous hairs. *Leaves* long-petioled; leaflets membranous, ovate, acute, rarely obtuse, 2–4 in. long. *Calyx* $\frac{1}{4}$ in., densely hairy. *Corolla* reddish, little exserted. *Pods* usually only 2–3 developed in the axil of each leaf, linear-oblong, recurved, densely pubescent, $1\frac{1}{2}$–2 in. by $\frac{1}{3}$–$\frac{3}{8}$ in., 3–4-seeded, subtorulose.

59. TERAMNUS, Sw.

Twining herbs, with exactly the habit of *Glycine*. *Calyx-tube* campanulate; teeth distinct, subequal or two upper not so long. *Corolla* little exserted; petals about equal in length; standard not spurred. *Stamens* monadelphous; alternate anthers small, abortive. *Ovary* sessile, many-ovuled; style short, curved, beardless, stigma capitate. *Pod* linear, hooked with the persistent style at the tip, flattish, septate between the seeds.—DISTRIB. Species 4, belting the world in the tropics.

1. **T. labialis,** *Spreng. Syst.* iii. 235; leaflets small acute or subobtuse, racemes usually peduncled elongated, calyx-teeth as long as the tube. *Benth. in Journ. Linn. Soc.* viii. 265. Glycine labialis, *Linn.*; *Roxb. Fl. Ind.* iii. 318; *W. & A. Prodr.* 208; *Wight Ic.* t. 168; *Dalz. & Gibs. Bomb. Fl.* 68. G. parviflora, *Lam.*; *DC. Prodr.* ii. 242; *Wall. Cat.* 5508 A–F. G. debilis and senegalensis, *DC. Prodr.* ii. 242. G. pallens, *Grah. in Wall. Cat.* 5518. G. warreensis, *Dalz. in Kew Journ.* iii. 210; *Dalz. & Gibs. Bomb. Fl.* 68. G. tenerrima, *Grah. in Wall. Cat.* 5520?

Plains from the foot of the WEST HIMALAYAS to CEYLON, BIRMA and PENANG.—DISTRIB. Cosmopolitan in the tropics, Natal.

Stems wide-climbing, slender, with a few fine adpressed hairs. *Stipules* minute, lanceolate, deciduous; petiole $\frac{1}{2}$–$1\frac{1}{2}$ in.; leaflets 3, membranous or subcoriaceous, green, with a few adpressed hairs above, grey and more hairy below, the end one ovate or oblong, 1–2 in. long. *Racemes* 1–4 in. long, usually lax, the pedicels fascicled. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in.; teeth lanceolate. *Corolla* reddish. *Pod* linear, glabrous, recurved, $1\frac{1}{2}$–2 in. long, 8–12-seeded.

VAR. *mollis*; stems and pods clothed with longer more spreading hairs, leaflets subcoriaceous densely pubescent beneath, calyx-teeth shorter. G. mollis, *W. & A. Prodr.* 209. G. parviflora, *Wall. Cat.* 5508, *G. H.* Teramnus mollis, *Benth. in Journ. Linn. Soc.* viii. 265.—**Distribution of the type.**

2. **T. flexilis,** *Benth. in Journ. Linn. Soc.* viii. 265; leaflets large acute, flowers in sessile congested racemes, calyx-teeth shorter than the tube. Glycine flexilis, *Grah. in Wall. Cat.* 5521.

EAST HIMALAYAS; forests of ASSAM, SILLET and CHITTAGONG.

More robust than the last, of which it may be a mere variety. *Stems,* petioles and leaves nearly glabrous. *Leaflets* subcoriaceous, the end one 3–5 in. long. *Racemes* 1 in. or less long. *Calyx*-teeth lanceolate-deltoid. *Pods* glabrous, 2½–3 in. long.

60. MUCUNA, Adans.

Perennials and annuals of wide-twining habit. *Leaves* ample, stipellate, always 3-foliolate. *Flowers* large, showy, usually dark purple, turning quite black when dried. *Calyx-tube* campanulate; two upper teeth quite connate; lowest longer than the middle ones. *Corolla* much exserted; standard not more than half as long as the rostrate keel, which usually a little exceeds the wings. *Stamens* diadelphous; anthers dimorphous, like those of the *Genisteæ.* *Ovary* sessile, many-ovuled; style incurved, beardless, stigma capitate. *Pod* very variable in shape and sculpture, usually covered with brittle needle-like irritating bristles.—DISTRIB. Species above 20, spread everywhere in the tropics.

SUBGEN. 1. **Amphiptera.** *Pod* broadly winged down both sutures and the faces covered also by close oblique plaits.

1. **M. imbricata,** *DC. Prodr.* ii. 406. Carpopogon imbricatum, *Roxb. Hort. Beng.* 54; M. monosperma, *Wall. Cat.* 5623 C, *ex parte.*

EAST HIMALAYAS, SILHET, SIKKIM, ASSAM, tropical region, 1–4000 ft., *Wallich Griffith, Hook. fil.*

A woody climber, with slender glabrescent branches. *Leaflets* membranous, with a few minute adpressed grey hairs below, glabrous above; the end one oblong-cuspidate, 5–6 in. long. *Racemes* few-flowered, lax, on drooping peduncles 2–12 in. long; pedicels ¼–½ in. long; bracts large, roundish, soon deciduous. *Calyx* ¾ in. long, with a few irritating bristles; teeth all nearly as long as the tube. *Corolla* dull purple, 2–2¼ in. long; keel abruptly inflexed at the tip; wings ½ in. broad; standard half as long as the keel, 1 in. broad. *Pod* oblong, 4–6 in. by 2 in., 2–4-seeded, clothed with abundant deciduous, irritating bristles; wings of sutures finally ½ in. broad.

M. ACUMINATA, *Grah. in Wall. Cat.* 5621 from PENANG, may perhaps belong to this group, but the fruit is unknown. The calyx is like that of *M. imbricata,* but the corolla is smaller and the racemes are short-peduncled and corymbose like those of *M. monosperma.*

SUBGEN. 2. **Citta,** *Lour.* *Pod* with the faces covered by close oblique plaits, but not winged down the sutures.

2. **M. monosperma,** *DC. Prod.* ii. 406; leaflets with a little ferruginous down, racemes short-peduncled close, upper calyx-lip subtruncate, pod one-seeded nearly as broad as long. *Wall. Cat.* 5623 A, B; *Wight in Hook. Bot. Misc.* ii. 346, *Suppl.* t. 12; *W. & A. Prod.* 254; *Dalz. & Gibs. Bomb. Fl.* 70. Carpopogon monospermum, *Roxb. Hort. Beng.* 54; *Fl. Ind.* iii. 283. M. cristata, *Ham. MSS.* M. corymbosa, *Grah. in Wall. Cat.* 5622. M. anguina, *Wall. Pl. As. Rar.* iii. 19, t. 236. Carpopogon anguineum, *Roxb. Cat. Hort. Beng.* 54.

EAST HIMALAYAS, tropical zone; KHASIA, ASSAM, CHITTAGONG, PEGU; TAVOY, *Gomez.* Hills of WEST PENINSULA and CEYLON, up to 3000 ft.

A woody climber, with slender glabrescent branches. *Leaflets* membranous or subcoriaceous, thinly clothed with ferruginous pubescence beneath; the end one oblong-cuspidate, 4–6 in. long. *Racemes* 6–12-flowered, corymbose, short-peduncled, or

subsessile; bracts none seen; pedicels $\frac{1}{2}$–$\frac{3}{4}$ in.; bracteoles linear, exceeding the bud. *Calyx* $\frac{3}{8}$ in., with copious irritating bristles; lower tooth linear; side ones deltoid. *Corolla* $1\frac{1}{2}$ in. long; keel abruptly inflexed at the tip; wings $\frac{1}{4}$ in., standard $\frac{1}{2}$ in. broad. *Pod* 3 in. long, obscurely stipitate, clothed with copious ferruginous or dull brown irritating bristles; wings $\frac{1}{4}$–$\frac{1}{3}$ in. deep.

3. **M. atropurpurea,** *DC. Prodr.* ii. 406; leaflets glabrous, racemes long-peduncled drooping elongated often forked, upper calyx-lip more than half as long as the tube, pod two-seeded twice as long as broad, *Wall. Cat.* 5620; *W. & A. Prodr.* 254. Carpopogon atropurpureum, *Roxb. Hort. Beng.* 54; *Fl. Ind.* iii. 287.

Plains of WESTERN PENINSULA and CEYLON. MALACCA, *Maingay.*

A woody climber, with very slender glabrous branches. *Leaflets* membranous, subconcolorous, shining on the upper surface, the end one oblong-cuspidate, 4–6 in. long. *Racemes* pendent, not corymbose; bracts small, ovate, soon deciduous; bracteoles oblong-spathulate, obtuse, $\frac{1}{4}$–$\frac{1}{3}$ in. *Calyx* $\frac{1}{2}$–$\frac{5}{8}$ in. long, deeply bilabiate, with a few ferruginous irritating bristles. *Corolla* dark purple, 2–$2\frac{1}{2}$ in. long; keel abruptly turned up at the end; wings $\frac{1}{2}$–$\frac{5}{8}$ in., standard 1 in. broad. *Pod* sessile, 3 in. long, the faces traversed with close oblique plaits, and furnished with abundant yellow-brown irritating bristles.

SUBGEN. 3. **Carpopogon,** *Roxb.* *Pod* broadly winged down both sutures, but not plaited on the faces.

4. **M. gigantea,** *DC. Prodr.* ii. 405; *Wall. Cat.* 5619; *W. & A. Prodr.* 254; *Wight in Hook. Bot. Misc.* ii. 351, *Suppl.* t. 14. Carpopogon giganteum, *Roxb. Hort. Beng.* 54; *Fl. Ind.* iii. 286. Dolichos giganteus, *Willd. Sp. Pl.* iii. 1041.—*Rheede Hort. Mal.* viii. t. 36.

Plains of the WESTERN PENINSULA; ANDAMANS, *Kurz.*—DISTRIB. Malaya, Philippines, Polynesia.

A woody climber, with slender glabrous branches. *Leaflets* subcoriaceous, subconcolorous, glabrous; end one oblong-cuspidate, 5–6 in. long. *Flowers* 12–30 in long-peduncled drooping close racemes; pedicels 1 in. long. *Calyx* $\frac{1}{4}$–$\frac{3}{8}$ in., with a few irritating bristles; upper lip subtruncate. *Corolla* yellow, 1–$1\frac{1}{4}$ in. long; keel not abruptly inflexed at the end. *Pod* 3–6 in. by 2 in., flat on the faces, copiously clothed with abundant deciduous yellow-brown irritating bristles, 2–6-seeded.

SUBGEN. 4. **Stizolobium,** *Pers.* *Pod* without either distinct plaits on the faces or wings down the sutures.

5. **M. macrocarpa,** *Wall. Cat.* 5618; woody, branches and leaves glabrous, upper lip of calyx subtruncate, pod very large sublignose glabrescent.

NIPAL and SILHET, *Wallich.* KHASIA and SIKKIM, 1–6000 ft., plentiful, *Hook. fil. & Thomson.*

Branchlets slender, terete. *Leaflets* subcoriaceous, the undersurface with a few adpressed deciduous hairs; end one ovate-cuspidate, 6–8 in. long. *Racemes* fascicled from the old wood, short-peduncled, with a densely brown-velvety rachis, the lower nodes sending out short branches; pedicels $\frac{3}{8}$–$\frac{1}{2}$ in., velvety, decurved; bracteoles $\frac{1}{2}$–$\frac{3}{4}$ in. obtuse, oblong. *Calyx* nearly 1 in. long, with a few irritating bristles; lower teeth as long as the tube. *Corolla* $2\frac{1}{2}$–3 in. long; keel abruptly turned up at the tip; wings $\frac{3}{4}$ in.; standard $1\frac{1}{2}$ in. broad. *Pod* 1–$1\frac{1}{2}$ ft. by $1\frac{1}{2}$–$1\frac{3}{4}$ in., 8–12-seeded, distinctly torulose, finely velvety at first, slightly channelled down both sides of both sutures.

6. **M. bracteata,** *DC. Prodr.* ii. 406; annual or perennial, branches and leaves below with a few adpressed hairs, flowers purple in short-peduncled

racemes, bracts ovate extending to the peduncle, pod glabrescent at first covered with short grey velvety tomentum without longitudinal furrows. *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 231. Carpopogon bracteatum, *Roxb. Hort. Beng.* 54.

EAST HIMALAYAS, tropical zone; ASSAM, *Masters.* KHASIA, *Griffith, Hook. fil. & Thomson.* CHITTAGONG, *Roxburgh.* AVA, PEGU and MARTABAN, *Kurz.*

Closely allied to *M. pruriens,* with which it quite agrees in calyx, corolla and shape and texture of leaflets. *Leaves* grey, with only a few obscure adpressed hairs below. Rachis of the *racemes* densely grey-pubescent; bracts broader and more persistent than in the rest of the group, those of the peduncle acuminate, $\frac{1}{2}$–$\frac{3}{4}$ in. long. *Pod* 3–4 in. long, similar in texture to that of *M. pruriens* and similarly abruptly recurved at the end.

7. **M. hirsuta,** *W. & A. Prodr.* 254; annual, branches and leaves below densely silky, flowers purple in long racemes, bracts small ovate or lanceolate, pod ribbed longitudinally clothed with yellow-brown irritating bristles.

Plains of WESTERN PENINSULA.

Branches slender, densely clothed with short fine deflexed ferruginous or grey hairs. *Leaflets* ovate-rhomboid, obtuse, with a cusp, membranous, thinly silky above, densely grey-silky beneath, ferruginous on the veins, 4–6 in. long. *Racemes* short-peduncled, $\frac{1}{2}$–$\frac{3}{4}$ ft. long, with a densely silky rachis. *Calyx* and *corolla* as in *M. pruriens.* *Pod* 3–4 in. long, reflexed at the end, 5–6-seeded.

8. **M. pruriens,** *DC. Prodr.* ii. 405; annual, branches with a few adpressed hairs, leaves grey-silky beneath, flowers in elongated racemes, bracts small lanceolate, pod ribbed longitudinally clothed with grey rarely ferruginous weak irritating bristles. *Wall. Cat.* 5616; *Wight in Hook. Bot. Misc.* 2, *Suppl.* t. 13. Carpopogon pruriens, *Roxb. Hort. Beng.* 34; *Fl. Ind.* iii. 283. Dolichos pruriens, *Linn. Sp.* 1020. M. prurita, *Hook. Bot. Misc.* ii. 348; *W. & A. Prodr.* 255; *Dalz. & Gibs. Bomb. Fl.* 70. M. utilis, *Wall.*; *Wight Ic.* t. 280.

From the HIMALAYAS, in the plains, to CEYLON and BIRMA.—DISTRIB. Cosmopolitan in the tropics. Often cultivated, as are the two following.

An annual, with slender terete branches, glabrescent when mature. *Leaflets* membranous, ovate-rhomboid, green, glabrescent above, lustrous with fine grey silky pubescence beneath, $\frac{1}{2}$–$\frac{3}{4}$ ft. long. *Racemes* short-peduncled, drooping, $\frac{1}{2}$–1 ft. long, the axis finely grey-silky; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in. *Calyx* $\frac{3}{8}$ in. long, with a few irritating bristles; upper lip and lanceolate teeth as long as the tube. *Corolla* purplish, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long; wings $\frac{1}{4}$ in. broad, rather shorter than the slightly incurved keel. *Pod* 2–3 in. long, 5–6-seeded, turgid, clothed with dense persistent bristles which are usually pale brown or steel-grey.—*M. utilis,* Wall. is a cultivated variety with a velvety pod. A variety occurs in Ceylon with short usually two-flowered peduncles. An allied plant from ASSAM, *Masters,* known in bud only, has closer laxer pubescence and large linear-setaceous bracts.

9. **M. capitata,** *W. & A. Prodr.* 255; annual, stem and under surface of the leaves glabrescent, flowers in short-peduncled few-flowered corymbs, bracts small lanceolate setaceous, pod shortly velvety glabrescent ribbed longitudinally. Carpopogon capitatum, *Roxb. Fl. Ind.* iii. 284. M. velutina, *Hassk. Hort. Bogor.* 277.

Foot of the WESTERN and EASTERN HIMALAYAS.—DISTRIB. Java.

Closely allied to *M. pruriens,* of which it may be a cultivated race. *Leaflets* the same texture and shape, but with only a few adpressed hairs, not silky below. *Corymbs* with 5–6 flowers, on short ascending peduncles. *Calyx* and *corolla* the same. *Pod* larger, 5–6 in. long, similarly turned up at the end, but the bristles much shorter and deciduous.

10. **M. nivea,** *DC. Prodr.* ii. 406; annual, stem and leaves beneath glabrescent, flowers white in long drooping racemes, bracts small linear-lanceolate, pods shortly velvety glabrescent ribbed longitudinally. *Wall. Cat.* 5624. Carpopogon niveum, *Roxb. Hort. Beng.* 54; *Fl. Ind.* iii. 285. M. nigra, *Ham. in Wall. Cat.* 5617.

AVA and BENGAL, perhaps cultivated only.

Like the preceding, perhaps only a cultivated race of *M. pruriens*. *Leaflets* $\frac{1}{2}$–$\frac{3}{4}$ ft. long, distinctly rhomboidal at the base, both sides at first with a few adpressed hairs. *Racemes* pendulous, often exceeding the leaves. *Pedicels, calyx* and *corolla* of *M. pruriens*, but the latter white. *Pod* half a foot long, black and destitute of bristles when mature, 6–8-seeded.

61. **APIOS,** Moench.

Twining herbs. *Leaves* pinnately 3–7-foliolate, stipellate. *Flowers* middle-sized, in lax racemes, with tumid nodes; bracts and bracteoles minute, deciduous. *Calyx* teeth shorter than the tube, two upper connate, lowest linear, the two others short, deltoid. *Corolla* much exserted, the much incurved narrow keel exceeding the spoonshaped standard, the wings still shorter. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, many-ovuled; style very long, filiform, beardless, much incurved, stigma capitate. *Pod* linear, compressed.—DISTRIB. Species 3, the two others Chinese and N. American.

1. **A. carnea,** *Benth. MSS.* Cyrtotropis carnea, *Wall. Cat.* 5527; *Pl. As. Rar.* 49, t. 62.

NIPAL, *Wallich.* KHASIA, 4–6000 ft., *Hook. fil. & Thomson, Lobb.*

Stems slender, soon glabrescent. *Petioles* 2–3 in.; leaflets usually 5, rarely 3, glabrous, green above, pale beneath, membranous, opposite, oblong, acute, 3–4 in. long. *Flowers* in long-peduncled flexuose secund racemes 6–9 in. long; lower pedicels fascicled, upper solitary; bracts and bracteoles minute, linear, caducous. *Calyx* green, glabrous, $\frac{1}{4}$–$\frac{3}{8}$ in. *Corolla* reddish, quite twice the calyx. *Pod* 4–5 in. long, glabrous, straight, 12–16-seeded.

62. **ERYTHRINA,** Linn.

Trees with prickly branches. *Flowers* large, coral-red, in dense racemes, produced usually before the development of the large constantly 3-foliolate leaves. *Calyx* oblique, spathaceous, finally slitting down to the base or campanulato-bilabiate. *Petals* very unequal; standard always much exserted and considerably exceeding the keel and wings. Upper *stamen* free down nearly to the base or connate with the others half way up the filaments; anthers uniform. *Ovary* stalked, many-ovuled; style incurved, beardless, stigma capitate. *Pod* linear, turgid, torulose.—DISTRIB. Species 25–30, principally tropical, in both the new world and the old, and at the Cape.

SUBGEN. 1. **Stenotropis,** *Hassk.* *Calyx* spathaceous, oblique, not at all 2-lipped, finally split to the base down the back.

1. **E. indica,** *Lam.*; *DC. Prodr.* ii. 412; calyx 5-cleft at the tip, keel-petals free, pod 6–8-seeded. *Roxb. Fl. Ind.* iii. 249; *Wall. Cat.* 5963; *W. & A. Prodr.* 260; *Bedd. Fl. Sylv.* 87; *Wight Ic.* t. 58; *Dalz. & Gibs. Bomb. Fl.* 70. E. spathacea, *Wall. Cat.* 5965. E. corallodendron, *Linn. Sp.* 992, *ex parte.* E. cuneata, *Grah. in Wall. Cat.* 5967.—*Rheede Hort. Mal.* vi. t. 7.

Foot of the HIMALAYAS to CEYLON, BIRMA and MALACCA, often planted.—DISTRIB. Java, Polynesia.

A tall tree, with thin grey bark, the prickles minute, conical, usually black. *Petioles* 4–6 in., mostly unarmed; leaflets membranous, subconcolorous, glabrous, the end one round-cuspidate, 4–6 in. long and broad, truncate or broad-rhomboidal at the base. *Racemes* dense, ½ ft. long, on spreading woody peduncles; pedicels ¼–⅓ in., downy. *Calyx* 1–1¼ in. long, with a very oblique mouth from the first, subglabrous, minutely 5-toothed at the very tip. *Standard* 2–2½ in. long, the blade 1 in. broad; wings and keel subequal, not more than half as long as the calyx. *Pod* ½–1 ft. long, distinctly torulose.—E. picta, *Linn.* (*Rumph, Amboin.* t. 77) appears to be a mere form of this, with variegated leaves.

2. **E. stricta,** *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 251; calyx entire at the tip, keel-petals connate, pod 2–3-seeded. *W. & A. Prodr.* 260; *Dalz. & Gibs. Bomb. Flora,* 70; *Bedd. Fl. Sylv.* t. 175. Micropteryx stricta, *Walp. in Linnæa,* xxiii. 740.

WESTERN PENINSULA, common.

A large tree. *Prickles* whitish, rarely extending to the petioles. *Leaflets* same shape as in *E. indica,* glabrescent on both surfaces. *Calyx* subglabrous, ½ in. long. *Standard* oblong-lanceolate, 1½ in. long; keel half as long as the standard, much exceeding the truncate wing. *Stamens* as in the last. *Pod* 4–5 in. long, less torulose than in the last, narrowed to both ends, glabrous, its stalk longer than the calyx.

SUBGEN. 2. **Micropteryx,** *Walp.* *Calyx* campanulate, more or less distinctly 2-lipped, but not splitting down to the base. *Pod* turgid and seed-bearing through its whole length.

3. **E. resupinata,** *Roxb. Cor. Pl.* t. 220; *Hort. Beng.* 53; *Fl. Ind.* iii. 257; herbaceous, leaflets as broad as long, limb of standard oblong. *DC. Prodr.* ii. 410; *Brand. For. Fl.* 141.

UPPER GANGETIC plain; Nawal Khar, *Dr. Brandis.* Oudh, *Dr. Stewart.*

Racemes direct from the rootstock, under a foot high, dense, appearing before the leaves. *Petioles* and peduncles prickly. *Leaflets* round-cordate, 2–3 in. long and broad. *Calyx* ¼ – ⅓ in. long, campanulato-bilabiate. *Standard* 3–4 times the calyx; keel half as long as the standard tinged with red, its petals united; wings much shorter, greenish. Upper *stamen* free from low down.

4. **E. ovalifolia,** *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 254; arborescent, leaflets twice as long as broad, glabrous, limb of the standard as broad as long. *Wall. Cat.* 5961; *Wight Ic.* t. 247; *Bedd. Fl. Sylv.* 88; *Benth. Pl. Jungh.* 237. E. picta, *Wall. Cat.* 5960, *non Linn.* Duchassaingia ovalifolia, *Walp. in Linnæa,* xxiii. 742.

Forests of SILLET, ASSAM, BENGAL, CEYLON, BIRMA and MALACCA.—DISTRIB. Java, Polynesia, and perhaps not distinct from American *E. glauca,* Willd.

Branches pale grey. *Prickles* usually black, not extending to the petiole. *Leaflets* subcoriaceous, glaucous, the end one ovate or obovate-oblong, very different in shape from that of any other species, often ½ ft. long, obtuse or subacute. *Calyx* ⅜–½ in., brown-velvety, splitting nearly down to the base in two halves. *Standard* deep scarlet, 1½–2 in. by 1½ in, emarginate; keel petals adherent, half as long as standard; wing rather shorter. *Pod* 6–8-seeded, ½ ft. long, distinctly torulose, narrowed into a short stalk.

5. **E. suberosa,** *Roxb. Hort. Beng.* 58; *Fl. Ind.* iii. 253; arborescent, leaflets as long as broad matted with pubescence beneath, limb of the standard 3–4 times as long as broad, pod turgid. *Wall. Cat.* 5959; *W. & A. Prodr.* 260; *Bedd. Fl. Sylv.* 87; *Dalz. & Gibs. Bomb. Fl.* 70. Micropteryx suberosa,

Walp. in Linnæa, xxiii. 744. E. alba, *Roxb. MSS.* E. Nahasuta, and E. reniformis, *Ham. in Wall. Cat.* 5966, 5968.

HIMALAYAS to CEYLON, ascending to 3–4000 in the north-west.

A tree, reaching 40–50 feet high, with corky deeply cracked bark. *Prickles* yellowish, longer than in the others. *Leaflets* green and glabrous above, 3–6 in. broad, often broader than deep, usually pointed, with a broad deltoid base, thickly matted with grey cottony down beneath. *Racemes* densely capitate. *Calyx* $\frac{3}{8}$ in. long, faintly downy, soon deeply bilabiate. *Standard* $1\frac{1}{2}$–2 in. long, its blade $\frac{1}{2}$–$\frac{5}{8}$ in. broad; keel-petals connate, less than half as long as the standard. Upper *stamen* free from low down. *Pod* $\frac{1}{2}$ ft. long, subterete, distinctly torulose, 4–5-seeded.

VAR. *sublobata*; Roxb. Fl. Ind. iii. 254 (sp.); leaflets larger conspicuously sinuated. *W. & A. Prodr.* 261; *Bedd. Fl. Sylv.* 87. E. maxima, *Roxb. MSS.* Macropteryx sublobata, *Walp. in Linnæa*, xxiii. 740. E. tomentosa, *Ham. in Wall. Cat.* 5964.—Orissa, *Roxburgh.* Mungger hills, *Hamilton.* Subalpine jungles of Western Peninsula, *Beddome.*

6. **E. arborescens,** *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 256; arborescent, leaflets as broad as long glabrous beneath, limb of the standard 2–3 times as long as broad, pod firm flattish. *Roxb. Cor. Pl.* t. 219; *Wall. Cat.* 5962; *Brand. For. Fl.* 140.

CENTRAL and EAST HIMALAYAS; KUMAON to SIKKIM and KHASIA, ascending to 7,000 ft.

A low tree, with few prickles on the branches. *Leaflets* membranous, greenish on both sides, the end one pointed, truncate or rather cordate at the base, often $\frac{3}{4}$–1 ft. broad. *Flower* very like that of *E. suberosa*, but the calyx larger and the limb of the standard broader. *Pod* much curved, $\frac{1}{2}$–$\frac{3}{4}$ ft. long, 1 in. or more broad, 4–6-seeded, narrowed gradually to a distinct beak and stalk.

SUBGEN. 3. **Hypaphorus,** *Hassk.* *Calyx* as in the last. *Pod* flat, seedless and indehiscent in the lower half, bearing 1–3 seeds towards the tip.—Connects *Erythrina* with *Butea* and *Spatholobus.*

7. **E. lithosperma,** *Blume, ex Miq. Flor. Ind. Bat.* i. 209. E. secundiflora, *Hassk. Pl. Jav. Rar.* 378; *Benth. Pl. Jungh.* 237, *non Brotero.*

RANGOON, *McClelland.*—DISTRIB. Java; Philippines, *Cuming*, 1161.

A tall tree, with branchlets often unarmed. *Leaflets* membranous, glabrous, greenish, the end one roundish, acute, 4–6 in. long. *Racemes* pilose, cotemporaneous with the leaves. *Calyx* velvety, $\frac{1}{4}$–$\frac{3}{8}$ in. long, finally splitting down nearly to the base in two lips. *Standard* $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, the limb oblong, obtuse; keel and wings subequal, $\frac{1}{3}$ in. long. *Pod* much recurved, 4–5 in. long, broader in lower half, with a stalk reaching $1\frac{1}{2}$–$1\frac{3}{4}$ in. long.—Kurz (Journ. Asiat. Soc. Beng. xlii. 2, 69) says Miquel's plant is not Blume's, and that it is *E. sumatrana*, Miq. Fl. Ind. Bat. Suppl. 304. I cannot, without specimens, clearly distinguish *E. holosericea*, Kurz loc. cit. from this; its pod is unknown.

63. **STRONGYLODON,** Vogel.

Twining herbs, with the habit of *Phaseolus*, with stipellate 3-foliolate leaves. *Flowers* in long lax racemes. *Calyx* campanulate, gibbous; teeth short, obtuse, imbricated. *Corolla* much exserted; standard lanceolate, recurved; wings obtuse, more than a third as long; keel curved, as long as the standard, narrowed into a long beak. *Stamens* diadelphous; anthers uniform. *Ovary* stalked,

few-ovuled, style filiform, beardless, stigma capitate. *Pod* oblong, turgid. *Seeds* as large as a bean, with a hilum running more than half round.—DISTRIB. Species 3, Polynesian.

1. **S. ruber,** *Vogel*; *Walp. Ann.* iv. 559; *A. Gray Bot. Amer. Explor. Expedit.*, 446, t. 48; *Thwaites Enum.* 89. Rhynchosia lucida, *DC. Prodr.* ii. 387.

CEYLON, near Kornegalle, *Thwaites.*—DISTRIB. Polynesia.

Stems firm, wide-twining, glabrous. *Leaflets* green, subconcolorous, glabrous, membranous, the end one roundish with a point, 4–6 in. long. *Racemes* copious, axillary, distinctly-peduncled, ½–1 ft. long; pedicels geminate from the tumid nodes, filiform, drooping, ½–1 in. *Calyx* glabrous, ¼–⅓ in., clasped at the base by a pair of short round deciduous bracteoles. *Corolla* bright red, 3–4 times the calyx. *Pod* oblong, 3 in. long, distinctly stalked, 2-seeded.

64. GRONA, Lour.

Twining herbs, with stipellate 1-foliolate leaves, deciduous stipules and bracts. *Racemes* with obscurely-swollen nodes. *Calyx-tube* campanulate; teeth elongated, upper 2 shorter. *Corolla* distinctly exserted, its petals nearly equal in length, both standard and wings spurred; keel obtuse, nearly straight. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, many-ovuled; style long, filiform, beardless, stigma capitate. *Pod* linear, turgid, septate between the seeds.—DISTRIB. Another species reported from Cochin China.

1. **G. Grahami,** *Benth. Pl. Jungh.* 233; flowers in very lax fascicled racemes, bracteoles a quarter as long as the calyx. Glycine Grahami, *Wall. Cat.* 5513.

PROME, *Wallich.*

A lax climber or trailer, the slender stems with a few adpressed hairs. *Leaflet* subcoriaceous, glabrous, subconcolorous, reticulato-venose, 3–6 in. long, acute, lower cordate-ovate, upper oblong-lanceolate; petiole ½–1½ in. *Racemes* 2–3 from each node, 1–3 in. long, the flowers in pairs from the distant nodes. *Calyx* glabrescent, ⅓ in; teeth all exceeding tube, lower linear, upper lanceolate. *Corolla* ½ in. reddish.

2. **G. Dalzellii,** *Baker*; flowers in dense usually sessile heads, bracteoles as long as the calyx. Galactia simplicifolia, *Dalz. in Kew Journ.* iii. 209; *Dalz. & Gibs. Bomb. Fl.* 69.

Plains of CONCAN, *Dalzell, Stocks.*

A herbaceous twiner, the slender stems with a few adpressed hairs. *Leaflets* membranous, with a few adpressed hairs on both sides, green above, glaucous below, ovate, acute, 2–4 in. long, lower cordate, upper rounded at the base; petiole ¾–1½ in. *Flowers* 6–12, in copious dense cymes. *Calyx* ⅙ in., clothed with dense ferruginous silky hairs; lower teeth lanceolate, upper deltoid. *Corolla* twice the calyx. *Pod* linear, straight, hairy, 2–2½ in. long, 8–10-seeded.

3. **G. filicaulis,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 232; flowers axillary.

PEGU, *Kurz.*

Voluble, slender. *Leaves* broad cordate-ovate, obtuse, mucronate, 1–1½ in. broad, palmately nerved, thinly hirsute on both sides; petiole ½–¾ in. *Flowers* small, yellow, pedicellate, cirrhoso-pedunculate. *Pod* slender, linear, glabrous, 1 in. long, 5–6-seeded; seeds shining, olive-green, mottled with black.—Kurz, loc. cit.

65. **GALACTIA,** P. Br.

Twining herbs, with 3-foliolate stipellate leaves, like *Glycine* in habit, but with the nodes of the raceme slightly tumid. *Calyx-tube* short; teeth linear or lanceolate, the two uppermost entirely fused in one. *Corolla* little exserted; its petals nearly equal in length; keel obtuse, nearly straight. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, many-ovuled; style long, filiform, beardless, stigma capitate. *Pod* linear, flattened, recurved.—DISTRIB. Species 45, mostly Tropical American.

1. **G. tenuiflora,** *W. & A. Prodr.* 206; leaflets small obtuse, flowers in pairs from the distant nodes of elongated racemes, hairs of calyx very short adpressed. Glycine tenuiflora, *Willd.*; *DC. Prodr.* ii. 241; *Roxb. Fl. Ind.* iii. 319.

Plains from the foot of the HIMALAYAS to CEYLON and SIAM.—DISTRIB. Natal, Zambesi-land, Australia, Malay isles.

Stems very slender, obscurely grey-downy. *Stipules* deciduous, minute; petiole 1–1½ in.; leaflets ovate or oblong, 1½–2 in. long, membranous, green, glabrescent above, grey, obscurely silky below. *Racemes* copious, peduncled, ¼–½ ft. long. *Calyx* ¼–⅓ in. long, finely grey silky; teeth lanceolate acuminate, exceeding the tube. *Corolla* reddish, ½ in. long. *Pod* 1½–2 in. by ⅓ in., glabrescent, 6–8-seeded.

VAR. 1. *lucida*; leaflets linear-oblong subcoriaceous glabrous on both surfaces sublucent above, flowers smaller. Glycine lucida, *Grah. in Wall. Cat.* 5511. G. graminea, *Heyne MSS.*—Western Peninsula.

VAR. 2. *minor*; stems very slender, leaflets and flowers smaller, the former oblong ½–1 in. long thinly grey silky below, corolla ¼–⅓ in. long, pod 1 in. long glabrous 4–5-seeded. Leucodictyon malvensis, *Dalz. & Gibs. Bomb. Flora*, 73. G. tenuiflora, *Wall. Cat.* 5509 *A.*—Western Peninsula.

VAR. 3. *villosa*; stems leaves below and pods densely grey-downy, leaflets oblong 1–1½ in. long, flowers fewer and smaller than in the type. G. villosa, *W. & A. Prodr.* 207. Glycine tenuiflora, *Wall. Cat.* 5509, *B, C.* G. filiformis, *Wall. Cat.* 5510 and 5519.—Western Peninsula.

VAR. 4. *latifolia*; stems and leaves below densely pubescent, leaflets subcoriaceous roundish 1½–2 in. long, racemes elongated, calyx hoary more deeply cleft.—Concan, *Stocks.*

2. **G.? oxyphylla,** *Benth. Pl. Jungh.* 233; leaflets large acute, flowers 2–4 in axillary nearly sessile cymes, hairs of calyx long and silky. Glycine oxyphylla, *Grah. in Wall. Cat.* 5522.

TENASSERIM; Tavoy, *Gomez.* Amherst, *Parish.*

Stems slender, clothed with conspicuous spreading deciduous ferruginous hairs. *Petioles* 2–3 in.; leaflets membranous, green, subconcolorous, with a few adpressed hairs on both surfaces, oblong, 3–4 in. long. *Bracts* lanceolate, nervose, subpersistent; bracteoles linear, as long as the tube. *Calyx* ⅜ in. long; teeth linear-setaceous, 2–3 times as long as the tube, plumose. *Corolla* reddish, ½ in. long. *Pod* unknown.—Recedes from *Galactia* by its cymose inflorescence and persistent nervose bracts.

66. **COCHLIANTHUS,** Benth.

A climbing herb. *Leaves* pinnately 3-foliolate, stipellate. *Flowers* racemed. *Calyx-tube* campanulate; teeth short, the lowest longest, lanceolate, the two upper fused into one. *Corolla* much exserted, the petals nearly equal in length; standard broad; keel narrow, curved, rounded at the end in a semicircle. *Stamens* diadelphous; anthers uniform. *Ovary* short-stipitate, many-ovuled; style

filiform incurved; stigma large, terminal. *Pod* linear, incurved, flattish.—DISTRIB. A single endemic species with the habit of a slender *Mucuna.*

1. **C. gracilis,** *Benth. Pl. Jungh.* 234. Mucuna? gracilis, *Grah. in Wall. Cat.* 5626.

NIPAL, *Wallich.*

A slender twining subglabrous herb, with both leaves and flower turning black when dried. *Leaves* distinctly petioled, 3-foliolate, stipellate, membranous, with a few adpressed hairs on both surfaces, grey beneath; end one ovate-rhomboidal, acuminate, 2–3 in. long. *Flowers* 6–20 in close racemes on drooping slender peduncles; bracteoles setaceous, very minute, deciduous. *Calyx* $\frac{1}{4}$ in., densely clothed with adpressed silky hairs. *Corolla* 3 times as long as the calyx.

67. SPATHOLOBUS, Hassk.

Woody climbers, with 3-foliolate stipellate leaves. *Flowers* small or middle-sized, in ample terminal panicles, extending into the axils of the upper leaves, the pedicels densely fascicled at the tumid nodes. *Calyx* campanulate; teeth lanceolate or oblong-deltoid, the upper two connate. *Corolla* distinctly exserted, its petals subequal, the keel obtuse, nearly straight. *Stamens* diadelphous; anthers uniform. *Ovary* sessile or stalked, 2-ovuled; style incurved, beardless, stigma capitate. *Pod* exactly like that of *Butea.*—DISTRIB. Species 10, the others Malayan and one Trop. African. By the pod dehiscing only at the seed-bearing apex this and *Butea* approach *Dalbergieæ.*

1. **S. Roxburghii,** *Benth. Pl. Jungh.* 238; leaflets subcoriaceous grey-canescent beneath, end one obovate-rhomboidal, flowers middle-sized, pod stalked usually equal in width throughout. Butea parviflora, *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 248; *DC. Prodr.* ii. 415; *Wall. Cat.* 5440; *W. & A. Prodr.* 261; *Wight Ic.* t. 210; *Dalz. & Gibs. Bomb. Fl.* 71. B. sericophylla, *Wall. Cat.* 5441.

Plains from the foot of the WEST HIMALAYAS to CEYLON, MARTABAN and TENASSERIM.

A robust climber, with densely grey-downy branches. *Petiole* $\frac{1}{4}$–$\frac{1}{2}$ ft.; leaflets subcoriaceous, dull green, glabrescent above, obtuse or shortly cuspidate, deltoid at the base, 6–9 in. long. *Panicle* reaching 1–1$\frac{1}{2}$ ft. long; branches very downy; pedicels $\frac{1}{24}$ in. or less long. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., densely grey-velvety; lower teeth lanceolate, nearly as long as the tube. *Corolla* bright red, half as long again as the calyx. *Pod* 3–4 in. long, usually 1 in. broad, clothed with ferruginous tomentum, which is thickest and darkest towards the tip, narrowed suddenly into a stalk $\frac{1}{2}$ in. long.

VAR. 1. *denudatus*; leaves nearly concolorous, calvate beneath. Butea gyrocarpa, *Wall. Cat.* 5442, *in part.*—Penang.

VAR. 2. *platycarpus*; pod nearly 2 in. broad conspicuously narrowed to the seed-bearing tip.—Concan, *Stocks.*

2. **S. gyrocarpus,** *Benth. Pl. Jungh.* 238; leaflets subcoriaceous ferrugineo-pubescent beneath, end one obovate-rhomboidal, flowers small, calyx densely grey-downy, teeth very short, pod sessile narrowed to the tip. Butea gyrocarpa, *Wall. Cat.* 5442, *ex parte.*

Forests of PENANG and MALACCA, *Wallich,* &c.—DISTRIB. Philippines, *Cuming,* 945.

A robust woody climber, with densely ferrugineo-pubescent branches. *Petiole* 4–6 in.; leaflets dull green, pubescent on the ribs above, not at all canescent, but beset with short spreading hairs and reticulato-venose beneath, the base rather rounded, the end one 6–9 in. long. *Panicle* 1 ft. long; branches very downy; pedicels very short.

Calyx ½ in.; teeth deltoid. *Corolla* reddish, ⅛ in. long; limb and standard broader than deep, emarginate. *Pod* like the samara of a sycamore reversed, finely downy, 3–5 in. long, more membranous than in the last.

3. **S. acuminatus,** *Benth. Pl. Jungh.* 238; leaflets subcoriaceous oblong cuspidate rounded at the base glabrous beneath, flowers small, calyx obscurely downy, teeth oblong half as long as the tube, pod sessile narrowed to the tip. Butea acuminata, *Wall. Cat.* 5443. Pongamia rosea. *Grah. in Wall. Cat.* 5907. P. rigida, *Wall. Cat.* 5908?

Forests of TENASSERIM and PENANG, *Wallich*, &c.

A robust climber, with branches minutely downy at first, soon glabrescent. *Petiole* 2–4 in. long; leaflets subconcolorous, pale grey-green on both sides, much thinner than in *S. crassifolius*, the end one 4–8 in. long. *Panicle* more than a foot long; pedicels much shorter than the calyx. *Calyx* $\frac{1}{12}$ in. *Corolla* bright red, three times the calyx; limb of the standard as long as broad. *Pod* just like that of *S. gyrocarpus*.—Here most likely belongs '*Pongamia?*' Wall. Cat. 9054, from Penang. We have a closely allied plant from MISHMI, *Griffith*, 1678, with a more rigid much recurved larger pod half a foot long; and another from CONCAN, *Stocks* (S. PURPUREUS, *Benth. MSS.*) with very dense panicles, dark purple corolla, and longer pedicels, which no doubt is distinct, but of which the pod is unknown.

4. **S. crassifolius,** *Benth. Pl. Jungh.* 238; leaflets very thick and rigid oblong cuspidate rounded at the base glabrous beneath, flowers small, calyx densely brown-velvety, teeth deltoid half as long as the tube, pod stalked. Pongamia crassifolia, *Wall. Cat.* 5913.

Forests of SILHET and PENANG, *Wallich*. KHASIA, *Griffith*.

Branches at first clothed with ferruginous pubescence. *Leaflets* like those of *S. acuminatus*, 6–9 in. long, thicker in texture, very shining on the upper surface, quite glabrous beneath from the beginning. *Pedicels* very short, the flowers densely clustered towards the end of the branchlets. *Calyx* $\frac{1}{12}$ in. long. *Corolla* dark purple, scarcely twice as long as the calyx; limb of the standard broader than deep, emarginate. *Pod* only seen very immature.

68. **BUTEA,** Roxb.

Erect trees or climbing shrubs, with 3-foliolate large stipellate leaves. *Flowers* densely fascicled, large, showy, in axillary racemes or terminal racemes or panicles. *Calyx* broadly campanulate; teeth short, deltoid. *Corolla* much exserted; petals nearly equal in length, the keel much curved, subobtuse or acute. *Stamens* diadelphous; anthers uniform. *Ovary* sessile or stalked, 2-ovuled; style filiform, curved, beardless, stigma capitate. *Pod* firm, ligulate, splitting round the single apical seed, the lowest part indehiscent.—DISTRIB. No other species.

1. **B. frondosa,** *Roxb. Cor. Pl.* 21, t. 21; *Fl. Ind.* iii. 244; an erect tree, lower calyx-teeth deltoid, keel much curved acute 4 times as long as the calyx, pod distinctly stalked. *Wall. Cat.* 5569, *ex parte*; *W. & A. Prodr.* 261; *DC. Prod.* ii. 415; *Wight in Hook. Bot. Misc.* iii. 102, *Suppl.* t. 32; *Beddome Fl. Sylv.* t. 176; *Dalz. & Gibs. Bomb. Fl.* 71; *Brand. For. Fl.* 142. Erythrina monosperma, *Lamk. Dict.* i. 391.—*Rheede Hort. Mal.* vi. t. 16–17.

Plains from the HIMALAYAS to CEYLON and BIRMA, ascending to 4000 ft. in the north-west.

An erect tree, reaching a height of 40–50 ft. *Shoots* clothed with grey or brown silky pubescence. *Petiole* ¼–½ ft.; leaflets 4–8 in. long, coriaceous, glabrescent above, densely finely silky and strongly veined below; end one roundish, with a rhomboid base, obtuse, often emarginate. *Racemes* ½ ft. long; pedicels ½–1 in., densely brown-velvety. *Calyx* ½ in. long, velvety. *Petals* bright orange-red, equal, thickly clothed on the outside with silvery tomentum, the standard 1 in. broad, the keel semicircular, beaked. *Pod* 6–8 in. by 1½–2 in., argenteo-canescent, narrowed suddenly into a stalk longer than the calyx.

2. **B. superba,** *Roxb. Cor. Pl.* 23, t. 22; *Hort. Beng.* 53; *Fl. Ind.* iii. 247; a climber, lower calyx-teeth lanceolate-deltoid, keel much curved acute 4–5 times as long as the calyx, pod distinctly stalked. *Wall. Cat.* 5438; *DC. Prodr.* ii. 415; *W. & A, Prodr.* 261; *Dalz. & Gibs. Bomb. Fl.* 71; *Brand. For. Fl.* 143. B. frondosa, *Wall. Cat.* 5569, *ex parte.*

Forests of CONCAN, BENGAL, ORISSA and BIRMA.

Very near the last, from which it differs mainly by its scandent habit, not by any botanical characters. *Leaflets* and flowers larger, the former reaching 20 in. long. *Racemes* 1 ft. long; pedicels sometimes 3 times as long as the calyx.

3. **B. minor,** *Ham. in Wall. Cat.* 5439; a climber, corolla three times the calyx, keel little curved subobtuse, pod subsessile.

East Himalayas; NIPAL, *Wallich*; SILHET, *Da Silva*; KHASIA, 1-4000 ft., *Hook. fil. & Thomson, Lobb.*; MISHMI, *Griffith.*

Branches robust, clothed at first with grey or brown silky hairs. *Petiole* $\frac{1}{4}$–$\frac{1}{2}$ ft.; leaflets obtuse or cuspidate, 6–15 in. long, coriaceous, scabrous above, finely silky beneath, the end one orbicular, with a rhomboidal base. *Racemes* $\frac{1}{4}$–1 ft. long. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in., brown-velvety, as are the pedicels; teeth very short. *Corolla* dull red, 1 in. long, densely velvety on the outside; keel rather exceeding the wings and standard, which is $\frac{1}{2}$ in. broad. *Pod* 3–3$\frac{1}{2}$ in. long by 1–1$\frac{1}{4}$ in., cuneate at the base.

69. MASTERSIA, Benth.

Calyx-tube turbinate; teeth long, lower lanceolate, two upper connate. *Corolla* scarcely exserted; petals nearly equal in length; standard roundish; keel obtuse, little curved. *Stamens* diadelphous; anthers uniform? *Ovary* sessile, many-ovuled; style short, filiform, incurved, stigma capitate. *Pod* linear-oblong, flat, indehiscent, the dorsal suture bordered by a narrow erect wing.—DISTRIB. A single endemic species, combining the habit of *Phaseoleæ* with the pod of *Dalbergieæ.*

1. **M. cleistocarpa,** *Baker.*

EAST HIMALAYAS, ASSAM and MISHMI, *Wallich, Griffith.*

A woody climber, with firm terete glabrous branches. *Leaves* 3-foliolate, distinctly petioled; leaflets subcoriaceous, stipellate, glabrous above, inconspicuously downy beneath; end one obovate-cuspidate, 5–6 in. long, rounded at the base. *Racemes* reaching a foot long; pedicels $\frac{1}{4}$–$\frac{1}{3}$ in., geminate, from very tumid nodes. *Calyx* $\frac{1}{2}$ in. long, the tube hidden by a pair of large round striated bracteoles. *Pod* shining, very flat, 3–5 in. by $\frac{3}{4}$–1 in.

70. CANAVALIA, DC.

Large twining perennials or biennials, with stipellate 3-foliolate leaves and showy flowers. *Calyx* deep, the limb 2-lipped, the upper lip projecting, entire or emarginate, the lower shortly 3-toothed. *Corolla* much exserted; standard large, roundish; wings shorter, equalling the incurved obtuse keel. *Stamens* monadelphous; anthers uniform. *Ovary* obscurely stalked, many-ovuled; style incurved, beardless, stigma terminal. *Pod* large, linear or oblong, flattish, with a distinct rib on each valve near the upper suture.—DISTRIB. Species about a dozen, two widely-spread in the tropics, the others mostly American.

1. **C. ensiformis,** *DC. Prodr.* ii. 404; leaflets ovate or oblong usually acute, racemes many-flowered, pod many-seeded. Dolichos ensiformis, *Linn. Sp. Pl.* 1022. C. gladiata, *DC. loc. cit.*; *Wall. Cat.* 5531; *W. & A. Prodr.* 253.

Dolichos gladiatus, *Jacq. Ic.* t. 560; *Roxb. Fl. Ind.* iii. 300. C. Loureirii, *G. Don Gen. Syst.* ii. 363. C. incurva, *DC. loc. cit.*—*Rheede Hort. Mal.* viii. t. 44.

EAST HIMALAYAS to CEYLON and SIAM, wild and commonly cultivated.—DISTRIB. Everywhere in the Tropics.

Stems wide-twining, perennial or biennial, glabrous. *Stipules* minute, deciduous; leaflets entire, ovate, membranous, glabrous, 4–6 in. long. *Peduncles* and racemes each $\frac{1}{4}$–$\frac{1}{2}$ ft. long; pedicels very short, geminate from the very tumid nodes; bracteoles minute, ovate, caducous. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in., glabrous, the upper lip a third of the length of the tube. *Corolla* more than twice as long as the calyx, red or white. *Pod* 6–9 in. by 1–1$\frac{1}{4}$ in., glabrescent, rather recurved, 8–12-seeded.

VAR. 1. *virosa*; leaflets obovate or obovate-oblong smaller more obtuse glabrous, axis of raceme more densely pubescent, pod 2–4 in. long 4–6-seeded, flowers smaller. Dolichos virosus, *Roxb. Hort. Beng.* 55; *Fl. Ind.* iii. 301. C. virosa, *W. & A. Prodr.* 253; *Dalz. & Gibs. Bomb. Fl.* 69.—Perhaps rather the wild form of the plant than a proper variety. Seeds said to be bitter in the variety, eatable in the type.

VAR. 2. *turgida*, Grah. in Wall. Cat. 5534 (sp.); leaves like the last, but the pod larger and more turgid, 3–5 in. by 1$\frac{1}{2}$–2 in. broad. *Miq. Fl. Ind. Bat.* i. 215. C. Stocksii, *Dalz. & Gibs. Bomb. Fl.* 69?

VAR. 3. *mollis*, Wall. Cat. 5533 (sp.); branches leaves and calyx densely clothed with short grey pubescence, pod small oblong slightly downy till mature. *W. & A. Prodr.* 253.—Nilghiris and Dindygul hills, in the Carnatic.

2. **C. obtusifolia,** *DC. Prodr.* ii. 404; leaflets obovate obtuse sometimes emarginate, racemes few-flowered, pod few-seeded. *Wall. Cat.* 5532; *W. & A. Prodr.* 253; *Clegh. in Madras Journ., new series*, vol. i. tab. iv. Dolichos obcordatus and rotundifolius, *Roxb. Hort. Beng.* 55; *Fl. Ind.* iii. 302–3. C. rosea, lineata and rutilans, *DC. loc. cit.* Rhynchosia rosea, *DC. Prodr.* ii. 387.

Coasts of WESTERN PENINSULA, CEYLON and MALAY PENINSULA.—DISTRIB. Cosmopolitan in the tropics.

A glabrous perennial. *Leaflets* thicker than in the last, 2–4 in. long, more conspicuously veined, often as broad as long. *Racemes* usually overtopping the leaves. *Flower* like that of the last, but the upper lip of the calyx rather shorter. *Pod* 4–5 in. by 1 in., glabrous, 4–6-seeded.

71. DIOCLEA, H.B.K.

Climbing shrubs. *Leaves* pinnately 3-foliolate, stipellate. *Flowers* blue or white, in elongated racemes with thickened nodes; bracts and bracteoles caducous. *Calyx-tube* campanulate; teeth as long as the tube, two upper quite connate. *Corolla* little exserted; petals about equal in length; keel incurved, but not beaked. *Stamens* monadelphous, but the uppermost free at the base; anthers uniform. *Ovary* subsessile, few-ovuled; style incurved, beardless, stigma capitate. *Pod* oblong, turgid, 1–2-seeded, flattened along the upper suture.—DISTRIB. Species 16, all the others Tropical American.

D. LASIOCARPA, *Mart.*, a common Tropical American species with lax racemes, small bracts, densely fascicled pedicels as long as the glabrous calyx and 6–8-seeded strap-shaped pods 4–6 in. long, is contained in the CONCAN collection of *Dr. Stocks*, probably introduced.

1. **D. reflexa,** *Hook. fil. Niger Flor.* 306. Dolichos coriaceus. *Grah. in Wall. Cat.* 5562. Dioclea javanica, *Benth. Pl. Jungh.* 236. D. Fergusonii, *Thwaites Enum.* 412.

Forests of SILHET, *Hook. fil. & Thomson.* PENANG and SINCAPORE, *Wallich.* TENASSERIM, *Helfer.* CEYLON, *Ferguson.*—DISTRIB. Malay isles, Trop. Africa, Trop. America.

A woody climber, with terete branches, at first pubescent. *Leaflets* subcoriaceous, obtuse or acute, pubescent beneath, 4–6 in. long. *Flowers* in peduncled dense subspicate racemes $\frac{1}{2}$–1 ft. long; bracts linear, reflexed, silky, $\frac{1}{2}$ in. long. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in., silky, with a pair of small obtuse bracteoles. *Corolla* reddish, half as long again as the calyx. *Pod* 3–4 in. long, glabrescent, but clothed at first with adpressed silky hairs.

72. **PUERARIA,** DC.

Twining shrubs or herbs, with stipellate 3-foliolate leaves; leaflets sometimes palmatifid. *Flowers* large or small, densely fascicled, in long often compound racemes. *Calyx-teeth* long or short, the two upper connate. *Corolla* distinctly exserted; standard usually spurred at the base, equalling in length the obtuse wings and keel. *Stamens* more or less thoroughly monadelphous; anthers uniform. *Ovary* sessile or nearly so, many-ovuled; style filiform, much incurved beardless, stigma capitate. *Pod* linear, flattish.—DISTRIB. Only one East Asian species not here represented.

SUBGEN. 1. **Pueraria** proper. *Flowers* produced after the leaves fall. *Pod* $\frac{1}{4}$–$\frac{1}{3}$ in. broad, with constrictions between the seeds that recall the articulations of Hedysareæ.

1. **P. tuberosa,** *DC. Prodr.* ii. 240; calyx densely silky, teeth subobtuse shorter than the tube, bracts very minute, lamina of wings oblique oblong, pod clothed with weak bristles. *Wall. Cat.* 5352; *W. & A. Prodr.* 205, 449; *Wight Ic.* t. 412; *Dalz. & Gibs. Bomb. Fl.* 67; *Benth. in Linn. Soc. Journ.* ix. 123. Hedysarum tuberosum, *Roxb. Hort. Beng.* 57; *Fl. Ind.* iii. 363.

WEST HIMALAYAS, tropical zone, ascending to 4000 ft. in KUMAON. Hills of WESTERN PENINSULA and ORISSA.

Root very large, tuberous. *Stems* shrubby, the branches finely grey-downy. *Stipules* minute, deciduous, cordate-ovate; leaflets membranous, roundish, $\frac{1}{2}$–1 ft. long, green, glabrescent above, densely clothed with whitish adpressed hairs beneath. *Flowers* in dense virgate leafless often panicled racemes, reaching 6–9 in. long; pedicels very short, densely fascicled. *Calyx* $\frac{1}{6}$–$\frac{1}{4}$ in. long, densely silky. *Corolla* bluish, not quite twice the calyx; limb of standard orbicular, distinctly spurred. *Pod* 2–3 in. long, membranous, flat, 3–6-seeded, clothed with long grey silky bristly hairs.

2. **P. Candollei,** *Grah. in Wall. Cat.* 5355; calyx subglabrous, teeth acute as long as the tube, bracts exceeding the buds, lamina of wings semicircular, pod subglabrous. *Benth. in Journ. Linn. Soc.* ix. 123.

PEGU, *Wallich, McClelland.* MOULMEIN, *Lobb.*

Shrubby, with slender terete glabrous branches. *Stipules* in the last; leaflets subcoriaceous, roundish, with an acute point, $\frac{1}{2}$–$\frac{3}{4}$ ft. long, both surfaces greenish, glabrescent. *Racemes* lax, virgate, panicled, reaching a foot or more long, the sulcate rachises subglabrous; pedicels $\frac{1}{12}$–$\frac{1}{8}$ in.; bracts linear, $\frac{3}{8}$–$\frac{1}{2}$ in. long. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., clasped by a pair of minute persistent ovate bracteoles. *Corolla* twice the calyx; limb of standard roundish, spurred. *Pod* 3 in. long, few-seeded.

SUBGEN. 2. **Neustanthus,** *Benth.* *Leaflets* entire, rarely faintly lobed, contemporaneous with the flowers. *Pod* $\frac{1}{4}$–$\frac{1}{2}$ in. broad, not constricted, 4–12-seeded.

3. **P. peduncularis,** *Grah. in Wall. Cat.* 5354; herbaceous, stipules basifixed, flower-pedicels exceeding the calyx, calyx-teeth small deltoid, corolla middle-sized, pod glabrous membranous. *Benth. in Journ. Linn. Soc.* ix. 124. Neustanthus peduncularis, *Benth. Pl. Jungh.* 235.

EAST HIMALAYAS and KHASIA MTS., temperate region, alt. 5–9000 ft.; NIPAL, SIKKIM, MISHMI.

Copiously twining, the slender firm branches clothed with short deflexed deciduous hairs. *Leaflets* membranous, green, with a few short hairs above, grey, densely shortly downy beneath; end one roundish, acuminate, 4–6 in. long. *Racemes* $\frac{1}{2}$–1 ft., short-peduncled, moderately close; nodes never produced into branches. *Pedicels* $\frac{1}{6}$–$\frac{1}{4}$ in., spreading, densely fascicled. *Calyx* $\frac{1}{8}$ in., finely grey-silky. *Corolla* reddish, $\frac{1}{2}$ in. long; standard $\frac{1}{4}$ in. broad, not spurred; keel with a deep purple tip. Upper *stamen* at last nearly free. *Pod* quite straight, strap-shaped, 2–3 in. by $\frac{1}{4}$ in., quite glabrous, 4–8-seeded, turgid opposite the seeds.

4. **P. Wallichii,** *DC. Prodr.* ii. 240; shrubby, stipules basifixed, flower-pedicels at most equalling the calyx, calyx-teeth deltoid, corolla middle-sized, pod glabrous rigid-coriaceous. *DC. Mem. Leg.* t. 43; *Wall. Cat.* 5353; *Benth. in Journ. Linn. Soc.* ix. 124. P. composita, *Grah. in Wall. Cat.* 5570.

EAST HIMALAYAS, tropical region; NIPAL, SILHET, KHASIA, MISHMI, ascending to 5000 ft. BIRMA; Taong-dong, *Wallich.*

Branches slender, terete, glabrous. *Leaflets* membranous or subcoriaceous, green, glabrescent above, grey with a few adpressed hairs beneath; end one 4–6 in. long, obovate-cuspidate, with a deltoid base. *Racemes* copious, $\frac{1}{4}$–$\frac{1}{2}$ ft. long, often fascicled or panicled; pedicels finely silky, densely fascicled, the nodes often lengthened out into short branchlets (*P. composita*, Wall.). *Calyx* gibbous, $\frac{1}{8}$ in.; teeth obscure. *Corolla* reddish, $\frac{1}{2}$–$\frac{5}{8}$ in. long; limb of standard twice as long as broad, not spurred at the base. *Pod* straight, 4–5 in. long, the sutures sometimes slightly repand.

5. **P. Stracheyi,** *Baker*; herbaceous, stipules deciduous, flower-pedicels nearly or quite as long as the calyx, calyx-teeth large nearly as long as the tube, corolla large.

KUMAON, Kalimundi, alt. 7300 ft., *Strachey* and *Winterbottom.*

Branches slender, with a few short deciduous hairs. *Leaflets* membranous, very thin, with a few obscure adpressed hairs on both surfaces, green above, paler below; end one obovate-oblong, cuspidate, rather rounded at the base, 3–4 in. long. *Flowers* in a long lax simple subsecund raceme, with a subglabrous rachis; pedicels $\frac{1}{6}$–$\frac{1}{4}$ in. *Calyx* subglabrous, $\frac{3}{8}$ in. long; lower tooth lanceolate, $\frac{1}{6}$ in. long, the others much shorter. *Corolla* reddish, $\frac{3}{4}$–$\frac{7}{8}$ in. long; standard $\frac{1}{2}$ in. broad, distinctly spurred. *Pod* unknown.

6. **P. Thomsoni,** *Benth. in Journ. Linn. Soc.* ix. 122; shrubby, stipules fixed by the centre, pedicels very short, calyx-teeth 3–4 times the tube, corolla large, pod densely clothed with long silky hairs. Dolichos spicatus, *Wall. Cat.* 5557 C. D. grandifolius, *Grah. in Wall. Cat.* 5556.

EAST HIMALAYA, temperate region. ASSAM, *Jenkins, Mrs. Mack.* KHASIA, 5–7000 ft., *Griffith, Hook. fil.* and *Thomson.* SILHET, *Gomez.*

A climber, with slender branches, clothed with deciduous deflexed fine brownish hairs. *Stipules* persistent, $\frac{1}{2}$–$\frac{3}{4}$ in. long; leaflets membranous, green, with a few obscure adpressed hairs above, grey with dense thin hairs beneath; end one roundish, obtuse or cuspidate, 6–9 in. long, rarely faintly lobed. *Racemes* close, simple, 6–9 in. long. *Calyx* $\frac{1}{2}$ in. long, densely silky; teeth lanceolate. *Corolla* reddish, half as long again as the calyx; standard $\frac{1}{2}$ in. broad, distinctly spurred. *Pod* 4–5 in. by $\frac{3}{8}$–$\frac{1}{2}$ in., flat, straight, membranous, 8–12-seeded.

7. **P. stricta,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 254; herbaceous, erect, pedicels longer than the very small calyx, pod glabrous 7–9-seeded.

PEGU and MARTABAN, *Kurz.*

A perennial, 2–4 ft. high, with subterete branches, tomentose when young. *Leaflets*

chartaceous, thinly clothed with adpressed hairs on both sides; end one ovate acute, 2–3 in. long. *Racemes* canescent, axillary and forming a terminal panicle; fruit-pedicels $\frac{1}{6}$ in.; bracts small, subulate, persistent. *Calyx* 1 in., puberulous. *Corolla* unknown. *Pod* linear, 1–$1\frac{1}{2}$ in. by $\frac{1}{5}$ in., flat, pale.—I have seen no specimens.

8. **P. hirsuta,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 254; herbaceous, twining, pedicels very short, calyx very small, pod clothed with few spreading hairs 2–4-seeded.

PEGU, *Kurz.*

Perennial, the obtuse angles of the branches beset with retrorse adpressed hairs. *Leaflets* chartaceous, furnished, especially below, with sparse adpressed hairs; end one ovate or ovate-lanceolate, $2\frac{1}{2}$–$3\frac{1}{2}$ in. long. *Racemes* axillary, densely pilose, usually 2–3-nate; bracts caducous; fruit-pedicels $\frac{1}{12}$ in. *Corolla* unknown. *Pod* linear-oblong, $\frac{1}{2}$–1 in. by $\frac{1}{4}$ in., flat, slightly torulose.—I have seen no specimens.

9. **P. brachycarpa,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 243; xliii. 2, 185; herbaceous, twining or diffuse, pedicels as long as the calyx, calyx very small, pod with a few adpressed hairs 5–6-seeded.

PEGU, *Kurz.*

A perennial, with long branches, clothed on the acute angles with retrorse hairs. *Stipules* small, lanceolate acuminate; leaflets chartaceous, with scattered adpressed hairs on both surfaces; end one ovate or ovate-lanceolate, $1\frac{1}{2}$–2 in. long. *Racemes* 1–2, stiff, axillary, pilose; bracts minute, subulate, persistent. *Calyx* $\frac{1}{12}$ in., pubescent. *Corolla* unknown. *Pod* linear-oblong, 1 in. by $\frac{1}{5}$ in., pale, compressed, torulose.—I have seen no specimens.

SUBGEN. 3. **Schizophyllon.** *Leaflets* usually deeply lobed, contemporaneous with the flowers. *Pod* $\frac{1}{8}$–$\frac{1}{6}$ in. broad, rather turgid, recurved at the tip, 10–15-seeded.

10. **P. phaseoloides,** *Benth. in Journ. Linn. Soc.* ix. 125. Dolichos phaseoloides, *Roxb. Fl. Ind.* iii. 316. Neustanthus subspicatus and phaseoloides, *Benth. Pl. Jungh.* 234, 235. Dolichos viridis, *Ham. in Wall. Cat.* 5559. D. spicatus, *Wall. Cat.* 5557 A. B. Phaseolus decurrens, *Grah. in Wall. Cat.* 5612. Pueraria subspicata, *Benth. in Journ. Linn. Soc.* ix. 125. D. ficifolius, *Grah. in Wall. Cat.* 5563.

EAST HIMALAYAS, tropical region; ASSAM, SIKKIM, KHASIA, SILHET, CHITTAGONG, BIRMA, PEGU, TENASSERIM, PENANG and MALACCA.—DISTRIB. China, Malay isles.

Stems wide-twining, often scarcely woody, clothed with dense spreading brown hairs. *Stipules* small, lanceolate, basifixed; leaflets membranous, green above, thinly clothed with adpressed bristly hairs, grey and densely matted beneath; end one very variable in size and shape, roundish, broad ovate or rhomboidal, entire or shallowly or deeply 3-lobed, 3–6 in. long. *Flowers* fascicled in copious long-peduncled racemes; pedicels very short; bracts and bracteoles lanceolate, strongly nerved, like those of *Shuteria*, the latter subpersistent. *Calyx* $\frac{1}{4}$–$\frac{3}{8}$ in. long, densely clothed with adpressed bristly hairs; lowest tooth lanceolate, as long as tube, others shorter, all setaceous at the tip. *Corolla* reddish, twice the calyx; blade of standard roundish, distinctly spurred. *Pod* glabrescent, 3–4 in. long.—N. SERICANS, *Miq. Flor. Ind. Bat.* i. 218, is a form with thin adpressed pubescence and large entire leaflets.

VAR. *javanicus*, Benth. (sp.); leaflets small thick entire obtuse densely pubescent, end one nearly as broad as long with a deltoid base. Pueraria javanica, *Benth. in Journ. Linn. Soc.* ix. 125. Neustanthus javanicus, *Benth. Pl. Jung.* 235; *Miq. Fl. Ind. Bat.* i. 218, t. 4 B. Pachyrhizus mollis, *Hassk. Cat. Bogor.* 280.—Khasia and Malacca.

73. **PHASEOLUS,** Linn.

Twiners, usually herbaceous, with 3-foliolate stipellate leaves. *Flowers* in copious axillary racemes; bracteoles usually conspicuous and persistent. *Calyx* campanulate, the lowest tooth usually longer than the rest and the two uppermost subconnate. *Corolla* much exserted, the keel prolonged into a very long beak which forms a complete, or in § *Dysolobium,* nearly complete, spiral. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, many-ovuled; style filiform, twisted round with the keel, conspicuously bearded down the side below the very oblique stigma. *Pod* linear, rarely oblong, subterete or subcompressed, more or less distinctly septate between the seeds.—DISTRIB. Species about 60, mostly tropical, many widely cultivated, especially in America.

SUBGEN. 1. **Phaseolus proper.** *Stipules* small, basifixed. *Pods* $\frac{1}{2}$–$\frac{3}{4}$ in. broad, subcompressed. *Keel* prolonged into a complete spiral.

1. **P. lunatus,** *Linn.*; *DC. Prodr.* ii. 393; twining, racemes lax short-peduncled many-flowered, pedicels longer than the calyx, corolla small greenish-yellow, bracteoles minute, pod recurved oblong 2–4-seeded. *Roxb. Fl. Ind.* iii. 287; *W. & A. Prodr.* 244. P. vulgaris, *Wall. Cat.* 5595, *non Linn.*

Everywhere cultivated, probably a native of America.—DISTRIB. Everywhere in the tropics.

A tall biennial, with stems at first minutely downy, soon glabrescent, easily distinguished from all the other species by the shape of the *pod,* which is 2–3 in. by $\frac{5}{8}$–$\frac{3}{4}$ in., less turgid than in any of the others, with the upper suture recurved and the lower broadly rounded. *Racemes* reach $\frac{1}{2}$ ft. long, the lower fascicles distant, with 2–4-flowers to a node; pedicels finally $\frac{1}{4}$–$\frac{1}{3}$ in. long. *Calyx* $\frac{1}{12}$ in.; teeth all very short. *Corolla* 3–4 times the calyx. *Seeds* large, very variable in colour.—P. INAMŒNUS, *Linn.*, XUARESII, *Zucc.*, PUBERULUS, *H.B.K.*, and TUNKINENSIS, *Lour.*, are cultivated varieties.

2. **P. vulgaris,** *Linn.*; *DC. Prodr.* ii. 392; suberect or twining, racemes lax subsessile few-flowered, pedicels longer than the calyx, corolla middle-sized white or lilac-purple, bracteoles often exceeding the calyx, pods linear recurved 4–6-seeded. *Roxb. Fl. Ind.* iii. 287; *W. & A. Prodr.* 243, *non Wall.* P. nanus, *Linn.*; *DC.*; *Roxb.*; *W. & A. loc. cit.* P. compressus, oblongus, saponaceus, tumidus, hæmatocarpus, sphæricus and gonospermus, *DC. loc. cit.*

Universally cultivated, but not anywhere clearly known as a wild plant.—DISTRIB. Spread everywhere, both in tropical and temperate regions.

A subglabrous annual. *Stems* low and suberect (P. NANUS, *Linn.*) or twining to a height of 6–10 ft. (P. VULGARIS, *Linn.*). *Racemes* much shorter than the leaves; pedicels finally $\frac{1}{4}$–$\frac{1}{3}$ in. long; bracteoles ovate or roundish, persistent. *Pod* 4–6 in. by $\frac{1}{2}$ in., glabrous, rostrate, turgid.—The Scarlet Runner, P. MULTIFLORUS, *Willd.*; *DC. Prodr.* ii. 392; *W. & A. Prodr.* 244; P. COCCINEUS, *Lam.*, differs by its bright scarlet casually white flowers, arranged in long racemes which often overtop the leaves.

3. **P. adenanthus,** *G. F. Meyer, Prim. Fl. Esseq.* 239; twining, racemes dense capitate, pedicels very short, corolla large red, pod linear recurved many-seeded. P. rostratus, *Wall. Pl. As. Rar.* t. 63; *Wall. Cat.* 5610; *W. & A. Prodr.* 244; *Wight Ic.* t. 34. P. alatus, *Roxb. Hort. Beng.* 54; *Fl. Ind.* iii. 288, *non Linn.* P. amarus, *Roxb. MSS.* P. cirrhosus and truxillensis, *H.B.K.*; *DC. Prodr.* ii. 391, 392. P. senegalensis, *Guill. & Per. Fl. Seneg.* 217.

Spread in the plains from the HIMALAYAS to CEYLON, not cultivated.—DISTRIB. Cosmopolitan in the Tropics.

A subglabrous perennial, with firmer leaves than in the cultivated species. *Stipules* $\frac{1}{8}$ in., often reflexed; leaflets entire, 3–4 in. long, subacute. *Flowers* very showy, crowded in a short-peduncled raceme. *Calyx* $\frac{1}{4}$ in.; lower teeth lanceolate- or deltoid-setaceous. *Standard* nearly 1 in. broad. *Pod* 4–6 in. by $\frac{1}{2}$ in., glabrous, much recurved, 10–15-seeded, subtorulose.

SUBGEN. 2. **Macroptilium.** Connects § 1 and 3, agreeing with the former in its basifixed stipules and with the latter in its narrow turgid pods.

4. **P. tenuicaulis,** *Baker*; a subglabrous slender twiner, stipules minute lanceolate, racemes few-flowered crowded subsessile, bracteoles lanceolate very minute, calyx campanulate with deltoid teeth, corolla small. P. sublobatus var.? tenuicaulis, *Grah. in Wall. Cat.* 5598.

BIRMA; Prome hills, *Wallich.*

Stems very slender, annual? at first minutely puberulent. *Stipules* not more than $\frac{1}{12}$ in.; leaflets membranous, glabrous, the end one ovate, acute, entire, 2–3 in. long. *Racemes* 5–6-flowered; lower pedicels shorter than the calyx. *Calyx* glabrous, $\frac{1}{12}$ in. *Corolla* 3 times the calyx, reddish. *Pod* unknown, so that its position is doubtful.

5. **P. Grahamianus,** *W. & A. Prodr.* 244; a glabrous perennial twiner, stipules minute lanceolate, racemes lax short-peduncled, bracteoles lanceolate very minute, calyx campanulate with deltoid teeth, corolla middle-sized. *Thwaites Enum.* 90.

CARNATIC; Courtallum, *Wight.* CEYLON; on the shore at Batticaloa, *Thwaites.*

Copiously twining, with slender woody branches. *Stipules* as in the last; leaflets quite glabrous on both sides, the end one ovate acute, 2–3 in. long, rather deltoid at the base. *Racemes* 2–4 in. long; peduncles about as long as the leaves; pedicels geminate, the lower finally as long as the calyx. *Calyx* $\frac{1}{8}$ in. long. *Corolla* reddish, 3–4 times the calyx. *Pod* linear, glabrous, rather recurved, many-seeded, $2\frac{1}{2}$–3 in. by $\frac{1}{6}$ in.

6. **P. semierectus,** *Linn.*; *DC. Prodr.* ii. 396; shrubby, suberect, with flexuose branches clothed with long deciduous deflexed hairs, stipules conspicuous lanceolate-setaceous, peduncles and racemes very long, bracteoles setaceous, calyx tubuloso-campanulate with aristate teeth, corolla middle-sized. *Jacq. Ic.* t. 558; *Bot. Reg.* t. 743. P. psoraleoides, *W. & A. Prodr.* 244; *Wight Ic.* t. 249.

Spread through the WESTERN PENINSULA and CEYLON, but probably not wild.—DISTRIB. Trop. America, Malaya.

Stems tall, suberect and shrubby in the lower part, quite terete. *Stipules* $\frac{1}{4}$–$\frac{3}{8}$ in. long; leaflets entire, membranous, soon glabrescent, thicker than in most of the species, the end one ovate, entire, acute or subobtuse, 2–3 in. long, usually deltoid at the base. *Peduncles* reaching a foot and racemes half a foot long; pedicels very short, geminate. *Calyx* under $\frac{1}{4}$ in. long, split open by the pod. *Corolla* deep purple and white, 3–4 times the calyx. *Pod* 3–4 in. by $\frac{1}{8}$ in., glabrous, rather recurved, many-seeded.

SUBGEN. 3. **Strophostyles.** *Stipules* inserted above the base. *Pods* under $\frac{1}{4}$ in. thick, subterete. *Keel* prolonged into a complete spiral. *Flowers* yellow. *Racemes* very close.

7. **P. trilobus,** *Ait. Hort. Kew,* iii. 30; stems slender diffuse glabrous or slightly hairy, stipules oblong, leaflets more or less deeply 3-lobed with the central division spathulate, racemes capitate, bracteoles ovate, flowers minute. *Roxb. Fl. Ind.* iii. 298; *Wall. Cat.* 5588 A–K.; *W. & A. Prodr.* 246; *Wight*

Ic. t. 94; *Dalz. & Gibs. Bomb. Fl.* 71. Dolichos trilobatus, *Linn.*; *Burm. Fl. Ind.* t. 50, fig. 1.; *DC. Prodr.* ii. 399.

HIMALAYAS to CEYLON and BIRMA, wild and commonly cultivated, ascending to 7000 ft. in the north-west.—DISTRIB. Afghanistan, Malay isles, Nubia, Abyssinia.

Perennial or annual. *Stems* trailing to a length of 1–2 feet, glabrous or furnished with a few deciduous spreading hairs. *Stipules* $\frac{1}{4}$–$\frac{3}{4}$ in., attached near the base; leaflets membranous, glabrous, or with only a few obscure loose or short hairs, rhomboid or ovate, 1–2 in. long, very rarely entire (var. OXALIDEUS, *Grah.*, P. CORNUTUS, *Blume*), usually shallowly lobed in the annual cultivated, deeply lobed in the perennial wild form, the central divisions broad, spoon-shaped, obtuse. *Flowers* in a close, deltoid head, on a peduncle that usually overtops the leaves; pedicels very short. *Calyx* campanulate, $\frac{1}{24}$–$\frac{1}{12}$ in., pale yellow; teeth deltoid. *Corolla* under $\frac{1}{4}$ in. long. *Pod* 1–2 in. by $\frac{1}{8}$ in., subcylindrical, glabrous, recurved, 6–12-seeded.

8. **P. aconitifolius,** *Jacq. Obs.* iii. t. 52; stems slender suberect or diffuse slightly hairy, stipules lanceolate, leaflets deeply 3-lobed with the central division ligulate, racemes capitate, bracteoles linear, flowers minute. *Roxb. Fl. Ind.* iii. 299; *W. & A. Prodr.* 247; *DC. Prodr.* ii. 394. P. trilobus, *Wall. Cat.* 5588 L–N. Dolichos dissectus, *Lam. Dict.* ii. 300.

HIMALAYAS to CEYLON, tropical region, up to 4000 ft. in the north-west.

Closely allied to the last, with which it agrees in flowers and general habit. *Stems* more copiously clothed with loose deflexed fine brownish hairs. *Stipules* much smaller and narrower. *Peduncles* hairy, like the stems; bracteoles twice as long as the calyx, their setaceous ciliated tips protruding beyond the buds. *Pods* rather stouter than in *P. trilobus* and seeds larger.

9. **P. grandis,** *Dalz. & Gibs. Bomb. Fl.* 72, *non Wall. Cat.* 5602; stems stout suberect, stipules very large obovate, leaflets obovate entire or distinctly lobed, racemes close, bracteoles enclosing the calyx and corolla, corolla middle-sized.

CONCAN, on the highest ghauts east of Bombay, *Stocks, Dalzell.*

Stems as robust as in the Common Bean, 2–4 ft. high, clothed with adpressed deciduous blackish bristles. *Stipules* persistent, ciliated, obovate-spathulate, 1–2 in. long, attached a little above the cordate base; leaflets rather fleshy, 3–4 in. long, clothed with short deciduous firm grey bristles, deltoid or rather rounded at the base, lobed only in the upper half. *Racemes* copious, on short or long suberect densely bristly peduncles; bracteoles nerved, obovate-oblong, $\frac{1}{4}$–$\frac{1}{3}$ in. long. *Calyx* $\frac{1}{8}$ in.; teeth lanceolate. *Pod* 2–3 in. long, at first densely bristly.

10. **P. pauciflorus,** *Dalz. in Kew Journ.* iii. 209; stems very slender twining subglabrous, stipules minute lanceolate, leaflets membranous entire or faintly lobed, racemes capitate, bracteoles linear, flowers minute, pod glabrous, *Dalz. & Gibs. Bomb. Fl.* 72.

Southern CONCAN, common, *Dalzell, Stocks.*

Stems very slender, climbing, quite glabrous when mature. *Stipules* $\frac{1}{8}$ in.; leaflets ovate, acute, $1\frac{1}{2}$–2 in. long, green above, paler beneath. *Flowers* 2–4, at the end of a slender peduncle about as long as the leaves; bracteoles twice as long as the calyx; pedicels shorter than the calyx. *Calyx* not more than $\frac{1}{2}$ in.; teeth shorter than the tube, lowest lanceolate. *Corolla* $\frac{1}{4}$ in., pale yellow. *Pod* $1\frac{1}{2}$–2 in. by $\frac{1}{8}$ in., subcylindrical, slightly recurved, 6–10-seeded.

P. SUBLOBATUS, *Wall. Cat.* 5598 C, from the estuary of the Irrawaddi, is closely allied to this, but at present is known only in the flowering state. It has firmer leaves, thinly clothed with adpressed grey bristles, 6–12-flowered short-peduncled racemes not closely capitate, and lanceolate bracteoles not longer than the calyx.

11. **P. Mungo,** *Linn.*; *DC. Prodr.* ii. 395; stems suberect or flexuose more or less densely clothed with loose deflexed hairs, stipules ovate, leaflets membranous entire, rarely faintly lobed, racemes capitate, bracteoles ovate or lanceolate, flowers middle-sized, pod clothed with long spreading deciduous silky hairs. *Roxb. Fl. Ind.* iii. 292 (*seeds green*); *Wall. Cat.* 5589 (*in greater part*); *W. & A. Prodr.* 245. P. Max, *Roxb. Hort. Beng.* 55; *Fl. Ind.* iii. 295 (*seeds black*); *Wall. Cat.* 5606. P. aureus, *Ham. in Wall. Cat.* 5590 (*seeds yellow*). P. hirtus, *Retz. Obs.* iii. 38, *non Wall.*

Wild and universally cultivated in the plains throughout our limits in a large number of forms, ascending to 6000 ft. in the N.W. Himalayas.—DISTRIB. Spread through tropics of Old World.

Stems annual, suberect in the typical form, 1–2 ft. high, copiously branched from the base, clothed with fine long deciduous brownish silky hairs. *Stipules* $\frac{1}{4}$–$\frac{1}{2}$ in. long, attached near the base; leaflets membranous, with scattered adpressed hairs on both sides, 2–4 in. long, roundish, acute or subobtuse, deltoid or rather rounded at the base. *Flowers* about half a dozen at the very end of short peduncles, clothed like the stems; pedicels very short. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in.; lower tooth deltoid or lanceolate. *Corolla* $\frac{3}{8}$–$\frac{1}{2}$ in., yellow. *Pod* $1\frac{1}{2}$–$2\frac{1}{2}$ in. long by $\frac{1}{6}$–$\frac{1}{5}$ in., subcylindrical, slightly recurved, 10–15-seeded.

VAR. 1. *glaber*, Roxb. Fl. Ind. iii. 291 (sp.), non Schlecht.; habit of the type, but stem leaves and pod quite glabrous. *Wall. Cat.* 5604. P. Mungo, F., *Wall. Cat.* 5589, *ex parte.* P. glabrescens, *Steud. Nomenc.* edit. 2, ii. 317. A cultivated form.

VAR. 2. *Wightianus*, Grah. in Wall. Cat. 5591 (sp.); stems elongated slender flexuose finely hairy, the hairs short and grey, leaflets thinner. P. Wightii, *W. & A. Prodr.* 245. P. subvolubilis, *Ham. in Wall. Cat.* 5605.

VAR. 3. *radiatus*, Linn. (sp.); stems elongated twining densely clothed, as are the peduncles and pod with long ferruginous deflexed silky hairs, leaflets firmer than in the last, similar to those of the type. *Roxb. Fl. Ind.* iii. 296; *Wall. Cat.* 5592; *DC. Prodr.* ii. 395. P. Roxburghii, *W. & A. Prodr.* 246. P. Mungo, *Wall. Cat.* 5589, *ex parte.* P. setulosus, *Dalz. in Kew Journ.* ii. 33; *Dalz. & Gibs. Bomb. Fl.* 72. Vigna opisotricha, *A. Rich. Fl. Abyss.* i. 220.

12. **P. trinervius,** *Heyne in Wall. Cat.* 5603; stems twining densely clothed with deflexed ferruginous hairs, stipules middle-sized oblong, leaflets entire or faintly lobed persistently pilose on both surfaces, racemes close, bracteoles oblong-lanceolate, pod at first densely silky. *W. & A. Prodr.* 245; *Dalz. & Gibs. Bomb. Fl.* 71. P. farinosus, *Linn.*; *DC. Prodr.* ii. 395?

Plains of WESTERN PENINSULA and CEYLON, ascending to 4000 ft.—DISTRIB. Malaya.

Perennial. *Stems* copiously twining, never suberect. *Stipules* like those of *P. Mungo*, but apparently attached higher up. *Leaflets* thicker in texture, often distinctly lobed, ovate, acute, 2–4 in. long, dark green, scabrous, with adpressed grey bristly hairs above, still more hairy beneath. *Flowers* 6-12, on long downy peduncles, the raceme finally 1–2 in. long; pedicels very short. *Calyx* $\frac{1}{8}$ in.; teeth deltoid. *Corolla* 3–4 times the calyx, yellow or reddish. *Pod* 2–$2\frac{1}{2}$ in. long, 10–12-seeded, slightly recurved.—Closely allied to *P. Mungo*, var. *radiatus*, and probably a fourth variety of that species.

13. **P. calcaratus,** *Roxb. Hort. Beng.* 54; *Fl. Ind.* iii. 289; stems suberect or flexuose clothed with fine deciduous deflexed hairs, stipules lanceolate, leaflets entire or faintly lobed, racemes not capitate, bracteoles linear, flowers middle-sized, pod glabrous. *Wall. Cat.* 5611; *W. & A. Prodr.* 245. P. sublobatus, *Wall. Cat.* 5598 A, B. P. hirtus, *Wall. Cat.* 5593. P. Mungo, *Wall. Cat.* 5589 C, *ex parte.* P. pubescens, *Blume*; *Miq. Flor. Ind. Bat.* i. 200.

HIMALAYAS to CEYLON, in the tropical zone, both wild and commonly cultivated, ascending to 5000 ft. in KHASIA.—DISTRIB. Malaya.

Closely allied to *P. Mungo*, and equally variable in general habit. Hairs of the *stem* short, but spreading, not ferruginous. *Stipules* much smaller and narrower; leaflets membranous, subglabrous, 2–4 in. long, the end one broad-ovate, acute. *Flowers* 10–20, the lower pedicels as long as the calyx, and the raceme finally 2–3 in. long. *Calyx* $\frac{1}{8}$ in.; teeth short, deltoid. *Corolla* $\frac{1}{2}$ in., yellow. *Pod* $2\frac{1}{2}$–3 in. by $\frac{1}{6}$–$\frac{1}{5}$ in., not so cylindrical as in *P. Mungo*, 8–12-seeded, glabrous from the beginning, considerably recurved.—P. TOROSUS, *Roxb. Fl. Ind.* iii. 298, is probably a cultivated form, with short suberect stems and subsessile congested racemes.

SUBGEN. 4. **Dysolobium.** *Stipules* small, basifixed, caducous. *Pod* linear, subterete, densely velvety or bristly. *Wings* distinctly shorter than the other petals. *Keel* prolonged into a long incurved beak but not forming a complete spiral.—Connects *Phaseolus* and *Vigna*.

14. **P. fuscus,** *Wall. Pl. As. Rar.* 6, t. 6; *Cat.* 5613; stems slender annual, leaflets ovate acute twice as long as broad softly downy, racemes short-peduncled few-flowered lax, corolla middle-sized. Dunbaria fusca, *Kurz in Journ. As. Soc. Beng.* xliii. 2, 186.

BIRMA; Prome hills, *Wallich*.

Stems firm, wide-twining, with many grooves. *Leaflets* membranous, dull green, thinly pubescent above, grey-green, more densely downy beneath, always entire, rounded at the base, narrowed gradually to a point, the end one 3–4 in. long. *Peduncles* 1–$1\frac{1}{2}$ in. long. *Racemes* 2–3 in. long, copious, much shorter than the leaves; pedicels geminate, spreading, $\frac{1}{12}$–$\frac{1}{6}$ in. *Calyx* under $\frac{1}{4}$ in., subglabrous, very gibbous, with a few long deciduous bristles; teeth ciliated, the lowest lanceolate, shorter than the tube. *Corolla* $\frac{1}{2}$ in.; standard $\frac{1}{2}$ in. broad, yellowish with red-brown lines externally; keel and wings yellow. *Pod* linear, 2–3 in. by $\frac{1}{4}$–$\frac{1}{3}$ in., brown, clothed with spreading brownish hairs, many-seeded.

15. **P. velutinus,** *Grah. in Wall. Cat.* 5615; stems woody, leaflets roundish cuspidate glabrescent above, racemes long-peduncled many-flowered, corolla large. P. grandis, *Wall. Cat.* 5602, *non Dalzell.* Canavalia grandis, *Kurz in Journ. As. Soc. Beng.* xliii. 2, 185.

EAST HIMALAYAS, tropical zone; NIPAL, ASSAM, CHITTAGONG. AVA, MOULMEIN, PEGU.

A woody climber, with very large leaves and flowers, by far the most showy of all the species. *Stems* terete, minutely pubescent. *Leaflets* thin, but flexible, full green, subscabrous at first above, paler green beneath, with copious obscure bristly hairs, broadly rounded at the base, 6–9 in. long. *Racemes* and woody terete peduncles reaching each 6–9 in. long; pedicels $\frac{1}{6}$–$\frac{1}{4}$ in.; bracteoles roundish, minute, adpressed to the calyx. *Calyx* $\frac{1}{2}$ in., finely silky; lowest tooth lanceolate, shorter than of the tube, the others much shorter still. *Corolla* reddish, more than twice as long as the calyx; standard 1 in. broad. *Pod* almost woody, subcylindrical, straight, $\frac{1}{2}$–$\frac{3}{4}$ ft. by $\frac{3}{4}$ in., deeply channelled down both sutures, densely brown-velvety.

74. **VIGNA,** Savi.

Twining herbs or shrubs, with exactly the habit of *Phaseolus*, from which they differ by having the style and keel much less curved and lengthened out. *Calyx* campanulate; teeth long or short, the upper often connate. *Corolla* much exserted; keel truncate or in § *Plectrotropis* prolonged into an ascending or slightly recurved beak. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, many-ovuled; style long, filiform, bearded along the inner face below the oblique stigma. *Pod* linear, subterete, subseptate.—DISTRIB. Species 40–50, mostly tropical, one widely cultivated.

VOANDEZIA SUBTERRANEA, *Thouars*; *DC. Prodr.* ii. 474, which is allied to *Vigna*, but may be easily known by its 1–2 ovulate ovary, which, by the torsion of the peduncle is thrust below the soil to ripen, and becomes a tuber-like pod, is occasionally cultivated, but less frequently than in Tropical Africa. Its native country is not clearly known.

SUBGEN. 1. **Vigna proper.** Keel not prolonged into a beak.

1. **V. repens,** *Baker*; stems trailing very slender, stipules minute lanceolate basifixed, leaflets membranous entire acute, flowers 1–2 together on very short geminate peduncles. Phaseolus repens, *Grah. in Wall. Cat.* 5608.

BIRMA, near Prome, *Wallich.*

Stems herbaceous, wide-creeping, glabrous. *Leaflets* firm, glabrous; the end one ovate, acute, 2–3 in. long. *Pedicels* very short, pubescent. *Calyx* $\frac{1}{4}$ in., slightly downy; teeth lanceolate-deltoid, shorter than the tube. *Corolla* reddish, 3 times the length of the calyx. *Pod* unknown.

2. **V. lutea,** *A. Gray in Bot. Wilkes Exped.* i. 452; stems perennial trailing, stipules minute lanceolate basifixed, leaflets obovate obtuse rather fleshy entire, racemes many-flowered long-peduncled, pods short few-seeded. Dolichos luteus, *Sw.*; *DC. Prodr.* ii. 398. Vigna anomala, *Walp. Rep.* i. 779. V. retusa, *Walp. Rep.* i. 778. Phaseolus obovatus, *Grah. in Wall. Cat.* 5609.

MARTABAN; Amherst, *Wallich.* ANDAMANS, *Kurz.* MALACCA, *Griffith.*—DISTRIB. Trop. America, Africa, Polynesia, Cape, N. Australia.

Stems wide-trailing, perennial, much stouter than in the last. *Leaflets* glabrous, with a subdeltoid base, the end one 2–3 in. long. *Peduncles* equalling or exceeding the leaves. *Flowers* 6–20, in a close raceme. *Calyx* campanulate, subglabrous, $\frac{1}{8}$ in.; teeth deltoid. *Corolla* yellow, 3–4 times the calyx. *Pod* 2–3 in. by $\frac{3}{8}$ in., quite glabrous from an early stage, subtorulose, 4–6-seeded.

3. **V. luteola,** *Benth. in Mart. Fl. Bras.* xv. 194, t. 50, fig. 2; stems slender herbaceous wide-twining subglabrous, stipules minute lanceolate basifixed, leaflets ovate acute membranous entire, racemes many-flowered long-peduncled, corolla middle-sized, pod short few-seeded. Dolichos luteolus, *Jacq. Hort. Vind.* i. 39, t. 90. D. gangeticus, *Roxb. Fl. Ind.* iii. 310; *Wall. Cat.* 5546. Vigna glabra and villosa, *Savi*; *DC. Prodr.* ii. 401.

BENGAL; Sunderbunds, *Roxburgh, G. Thomson.* CEYLON, *Thwaites.* PEGU, *Kurz.*—DISTRIB. Cosmopolitan in tropics, Cape.

A trailing or twining perennial. *Leaflets* glabrous, or with a few spreading grey silky hairs, narrowed gradually to a point, always entire, the end one 2–3 in. long. *Flowers* 12–20, on peduncles equalling or exceeding the leaves; pedicels slightly downy, finally as long as the calyx; bracts and bracteoles very minute. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in., subglabrous; lower tooth lanceolate, as long as the tube, the others deltoid. *Corolla* 3–4 times the calyx. *Pod* glabrescent, recurved, 2–4 in. by $\frac{1}{2}$ in., 6–12-seeded.

4. **V. Catiang,** *Endl.*; *Miq. Flor. Ind. Bat.* i. 188; annual, suberect or twining, stipules large attached above the base, leaflets membranous ovate-rhomboidal entire or slightly lobed, racemes few-flowered long-peduncled, pod very long many-seeded. Dolichos Catiang, *Linn*; *DC. Prodr.* ii. 399; *Roxb. Fl. Ind.* iii. 303; *Wall. Cat.* 5549. D. sinensis, *Linn.*; *DC. loc. cit.*; *Roxb. Fl. Ind.* iii. 302; *Wall. Cat.* 5550; *Bot. Mag.* t. 2232; *W. & A. Prodr.* 250. Vigna sinensis, *Endl.*; *Hassk. Pl. Jav. Rar.* 386. Dolichos tranquebaricus, *Jacq. Hort. Vind.* iii. t. 70. D. monachalis, *Brot.*; *DC. Prodr. loc. cit.*

Native and universally cultivated in the tropical zone.—DISTRIB. Tropics of old world.

Low and suberect (*V. Catiang*) or tall and voluble (*V. sinensis*), always glabrous or nearly so. *Stipules* $\frac{1}{3}$–$\frac{1}{2}$ in. long, attached and persistent as in *Phaseolus* § *Strophostylis*; leaflets membranous, 3–6 in. long, acute, very variable in shape, broad or narrow ovate, or ovate-rhomboidal, with the two sides below the middle prolonged into obtuse lobes. *Peduncles* often exceeding the leaves, 3–6-flowered; pedicels very short. *Calyx* glabrous, under $\frac{1}{2}$ in; teeth lanceolate or deltoid-cuspidate. *Corolla* yellow or reddish, twice the calyx. *Pod* in some of the cultivated forms 1 or even 2 feet long, under $\frac{1}{2}$ in. broad, edible; seeds 10 to 20.

SUBGEN. 2. **Plectrotropis.** *Keel* prolonged into a distinct beak, so that this group connects *Vigna proper* with *Phaseolus.*

5. **V. vexillata,** *Benth. in Mart. Fl. Bras.* xv. 194, t. 50, fig. 1; stems herbaceous with a few deflexed brown hairs, leaflets membranous ovate or lanceolate acute, flowers 2–4 at the end of long peduncles, corolla large, pod slender glabrescent. Phaseolus vexillatus, *Linn. Sp. Pl.* 1017. P. sepiarius, *Dalz. in Kew Journ.* ii. 33; *Bomb. Flora,* 72. P. pulniensis, *Wight Ic.* t. 202. P. angustifolius, *Wall. Cat.* 5596. P. fusiformis, *Grah. in Wall. Cat.* 5607. Vigna carinalis, *Benth. Bot. Sulph.* 86.—*Dill. Hort. Elth.* ii. t. 302.

Himalayas, from SIMLA to KUMAON and KHASIA, ascending to 8000 ft.. Hills of WEST PENINSULA and CEYLON.—DISTRIB. Cosmopolitan in tropics, Cape, Australia.

Root fusiform, perennial. *Stems* wide-twining, glabrescent when mature. *Stipules* $\frac{1}{8}$–$\frac{1}{4}$ in., lanceolate, basifixed; leaflets with few or copious adpressed brownish or grey hairs, varying in shape from broad ovate to lanceolate, 2–6 in. long, always acute, the base rounded. *Peduncles* $\frac{1}{4}$–1 ft.; bracteoles setaceous. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in., silky; teeth linear-lanceolate, as long as the tube. *Corolla* reddish-purple, 1 in. or more long; standard 1–1$\frac{1}{4}$ in. broad. *Pod* 3–4 in. by $\frac{1}{4}$ in., thinly silky at first, 10–15-seeded.

VAR. *Stocksii*, Benth.; leaflets small ovate, brown hairs of the leaves and stem more abundant and persistent. Concan, *Stocks.*

6. **V. brachycarpa,** *Kurz in Journ. Asiat. Soc. Beng.* xliii. 2, 185; stems herbaceous slightly hairy, leaflets chartaceous linear or lanceolate-deltoid acuminate, flowers few crowded at the end of long peduncles, corolla small, pod linear-oblong with a few long hairs.

ARRACAN, *Kurz.*

A perennial climber, with filiform stems. *Stipules* $\frac{1}{4}$–$\frac{1}{3}$ in., linear-oblong, peltate; petiole 1–1$\frac{1}{2}$ in., pilose; leaflets 1–2 in., thinly hairy on both sides. *Peduncles* equalling or exceeding petioles; pedicels very short. *Calyx* glabrous, $\frac{1}{8}$ in.; teeth broad, short, acute. *Corolla* yellow, $\frac{1}{8}$ in. *Pod* 1 in. by $\frac{1}{5}$ in., stiff, compressed, black, many-seeded. I have seen no specimens.

7. **V. Wightii,** *Benth. MSS.*; stems woody finely grey-downy, leaflets subcoriaceous small ovate subobtuse, flowers 2–3 on the end of long peduncles, corolla large. *Bedd. Ic. Pl. Ind. Or.* t. 296.

CARNATIC; Courtallum, *Wight, Thomson.*

A slender twiner, with slender sulcate glabrescent stems. *Stipules* minute, lanceolate, basifixed, caducous; leaflets glabrescent above, thinly silky below, 2–3 in. long. *Peduncles* reach 6–9 in; pedicels very short; bracteoles minute, setaceous. *Calyx* $\frac{3}{8}$ in., finely downy; lower teeth linear, nearly as long as the tube. *Corolla* reddish, 1$\frac{1}{4}$ in. long; standard roundish, emarginate, 1$\frac{1}{2}$ in. broad. *Pod* not known.

8. **V. dolichoides,** *Baker*; stems woody with short adpressed grey hairs, leaflets subcoriaceous roundish cuspidate with copious adpressed bristly hairs, racemes many-flowered short-peduncled, corolla middle-sized, pod stout short clothed with dense firm spreading grey silky hairs. Phaseolus dolicho-

ides, *Roxb. Hort. Beng.* 54; *Fl. Ind.* iii. 290; *Wall. Cat.* 5600. Mucuna recta, *Wall. Cat.* 5625. Dolichos dasycarpus, *Miq. Flor. Ind. Bat.* i. 186. Canavalia dolichoides, *Kurz in Journ. Asiat. Soc. Beng.* xliv. 2, 185.

EAST HIMALAYAS, tropical zone; SILHET, KHASIA and ASSAM.—DISTRIB. Java.

Stems wide-twining, clothed densely with persistent rather bristly pale brown hairs. *Stipules* lanceolate, minute; leaflets always entire, as broad as long, flexible, 4–6 in. long, densely clothed, especially below, with short bristly hairs. *Racemes* 2–3 in., conical in bud, sometimes nearly sessile; pedicels shorter than the calyx; bracteoles minute, lanceolate. *Calyx* $\frac{1}{8}$ in., clothed with adpressed hairs; teeth deltoid, lowest lanceolate. *Corolla* reddish, 3–4 times the calyx. *Pod* 2–3 in. by $\frac{1}{2}$ in., firm, cylindrical, 5–6-seeded, the very dense spreading velvety hairs persistent.

9. **V. pilosa,** *Baker*; stems slender woody finely grey-downy, leaflets membranous ovate acute with a few short adpressed hairs, racemes many-flowered short-peduncled, corolla middle-sized, pod slender clothed with dense silky hairs. Dolichos pilosus, *Roxb. Hort. Beng.* 55; *Fl. Ind.* iii. 312; *DC. Prodr.* ii. 397; *W. & A. Prodr.* 249. Phaseolus difformis, *Wall. Cat.* 5599.

East Himalayas, tropical zone; ASSAM, NIPAL, SIKKIM, PROME, WESTERN PENINSULA and ORISSA.

Branches very slender, but firm, glabrescent. *Stipules* minute, lanceolate, caducous; leaflets usually twice as long as broad, narrowed gradually to a point, 4–6 in. long, thin, but firm, both sides subscabrous. *Racemes* 2–3 in. long, much shorter than the leaves; pedicels finally $\frac{1}{8}$ in.; bracts and bracteoles minute. *Calyx* $\frac{1}{4}$-$\frac{1}{3}$ in., thinly silky, oblique; lower tooth lanceolate, as long as the tube. *Corolla* reddish, twice the calyx. *Pod* 4–5 in. by under $\frac{1}{4}$ in., beaked, rather recurved, 8–12-seeded, the short fine brown hairs spreading and persistent.

10. **V. lucens,** *Baker*; stems woody glabrous, leaflets entire membranous ovate acute glabrous, racemes sublax many-flowered about as long as the leaves, corolla middle-sized, pod slender densely velvety. Phaseolus lucens, *Wall. Cat.* 5601. Canavalia lucens, *Kurz in Journ. Asiat. Soc. Beng.* xliii. 2, 185.

TAVOY, *Gomez*.

A wide-climbing perennial, with only the youngest branches clothed with a few adpressed grey hairs. *Leaflets* green on both sides, rounded at the base, narrowed gradually to a point, 4–6 in. long; stipules minute, lanceolate, caducous. *Racemes* and peduncles each 2–3 in. long; pedicels very short; bracteoles minute, ovate. *Calyx* $\frac{1}{4}$ in. long, nearly glabrous; lower tooth lanceolate, shorter than the tube. *Corolla* reddish, 3 times the calyx. *Pod* beaked, many-seeded.

75. PACHYRHIZUS, Rich.

Wide-climbing herbs. *Leaves* pinnately 3-foliolate with stipellate lobed leaflets. *Racemes* long, with tumid nodes and fascicled pedicels; bracts and bracteoles setaceous, caducous. *Calyx* 2-lipped, the limb as long as the tube, the upper lip emarginate, the lower deeply 3-toothed. *Corolla* much exserted, the petals subequal; keel obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, many-ovuled; style long, circinate at the apex, bearded down the inner side below the very oblique stigma. *Pod* large, linear, turgid, deeply depressed between the seeds.—DISTRIB. Species 2 or 3, the others Mexican and Angolan.

1. **P. angulatus,** *Rich.*; *DC. Prodr.* ii. 402; *Wall. Cat.* 5526; *W. & A. Prodr.* 251. Dolichos bulbosus, *Linn.*; *Roxb. Fl. Ind.* iii. 309. P. trilobus, *DC. loc. cit.*

Cultivated throughout our limits, but not known in a wild state.—DISTRIB. Everywhere in the tropics.

Root a large tuber, like a turnip, which is eaten both raw and boiled. *Stems* wide-twining, suffruticose, clothed with short deciduous pubescence. *Leaflets* large, membranous, glabrous, as broad as long, deeply or shallowly lobed in the upper half, the base deltoid. *Racemes* lax, $\frac{1}{2}$–1 ft., the lower nodes often prolonged into short branches; bracteoles setaceous. *Calyx* $\frac{1}{4}$ in., as long as the pedicel. *Corolla* reddish, 1 in. or more long. *Pod* 6–9 in. long, 8–12-seeded, straight, glabrescent.

76. CLITORIA, Linn.

Scandent or suberect undershrubs, with the most showy flowers of all the *Phaseoleæ*, 3–7-foliolate leaves, stipellate leaflets and persistent membranous small stipules and bracts and large bracteoles. *Calyx* membranous, tubular; teeth deltoid or lanceolate. *Corolla* much exserted; standard spoon-shaped, very large; wings and incurved keel much shorter. *Stamens* monadelphous or diadelphous; anthers uniform. *Ovary* stalked, many-ovuled; style incurved, flattened, bearded along the inner side. *Pod* linear, flattish or turgid.—DISTRIB. Species 27, in tropics of old and new world, mostly the latter.

SUBGEN. 1. **Ternatea.** *Pod* flattish, the valves not keeled on the face.

1. **C. Ternatea,** *Linn.*; *DC. Prodr.* ii. 233; stems terete scandent, petioles short, leaflets 5–7, flowers solitary, bracteoles large. *Wall. Cat.* 5344; *Bot. Mag.* t. 1542; *Roxb. Fl. Ind.* iii. 321; *W. & A. Prodr.* 205; *Dalz. & Gibs. Bomb. Fl.* 68.

Tropical zone from the HIMALAYAS to CEYLON, BIRMA, and MALACCA.—DISTRIB. Cosmopolitan in the tropics, common in cultivation.

A *climber*, with slender downy stems. *Stipules* minute, linear; petiole $\frac{1}{2}$–1 in.; leaflets ovate or oblong, obtuse, subcoriaceous, 1–2 in. long. *Bracteoles* roundish, obtuse, $\frac{1}{4}$–$\frac{1}{2}$ in. long. *Calyx* $\frac{1}{2}$–$\frac{3}{4}$ in.; teeth lanceolate, half as long as the tube. *Corolla* $1\frac{1}{2}$–2 in.; standard 1 in. broad, bright blue, with an orange centre. *Pod* 2–4 in. long, 6–10-seeded.

VAR. 1. *pilosula,* Wall. Cat. 5347 (sp.); leaflets and flowers much smaller, the former $\frac{1}{2}$–$\frac{3}{4}$ in. long, standard white an inch long.—Guzerat, *Stocks.*

2. **C. biflora,** *Dalz. in Kew Journ.* ii. 35; stems suberect angular, petioles very short, leaflets 5, flowers geminate, bracteoles large. *Dalz. & Gibs. Bomb. Fl.* 68.

In the CONCAN, common; *Dalzell, Stocks, Law.*

Scarcely shrubby, the young branches densely pubescent. *Stipules* minute, lanceolate; petiole $\frac{1}{4}$–$\frac{1}{3}$ in.; leaflets membranous, 2–3 in. long, ovate or oblong, usually acute. *Flowers* copious, scarcely peduncled; bracteoles $\frac{1}{4}$–$\frac{1}{3}$ in., ovate or lanceolate aristate. *Calyx* $\frac{1}{2}$–$\frac{5}{8}$ in.; teeth shorter than the tube, lanceolate, aristate. *Corolla* like that of the last, but much smaller. *Pod* 1–2 in. long, firm, 5–6-seeded.

3. **C. mariana,** *Linn.*; *DC. Prodr.* ii. 234; a climber, petioles long, leaflets 3, bracteoles small, flowers 2 peduncled, calyx glabrous, teeth much shorter than the tube. C. mexicana, *Link. Enum. Hort. Berol.* ii. 235. C. acuminata, *Grah. in Wall. Cat.* 5346. C. Grahami, *Steud.*; *Benth. Pl. Jungh.* 232.

KHASIA, temperate region, alt. 5–6000 ft., *Hook. fil. & Thomson, Lobb.* TAVOY, *Wallich.* DISTRIB. Mexico, United States.

Stems slender, terete, glabrous. *Stipules* lanceolate, $\frac{1}{8}$–$\frac{1}{4}$ in.; petiole $1\frac{1}{2}$–2 in.; leaflets membranous, glabrous, ovate, pale beneath, 2–4 in. long, acute or subobtuse. *Peduncles* $\frac{1}{2}$–2 in., with a pair of minute lanceolate bracts at the apex; bracteoles lan-

ceolate, $\frac{1}{8}$–$\frac{1}{4}$ in. *Calyx* $\frac{5}{8}$–$\frac{3}{4}$ in. *Standard* pale blue, 2 in. by $1\frac{1}{4}$ in. *Pod* more turgid than in the two preceding.

4. **C. macrophylla,** *Wall. Cat.* 5345; a climber, petioles long, leaflets 3, bracteoles small, flowers 3–6 fascicled in the axils of the leaves, calyx downy, teeth as long as the tube. *Benth. Pl. Jungh.* 232.

MARTABAN, *Parish.* TENASSERIM, *Helfer.* BIRMA, *Wallich.*

Similar to the last in general habit, bracteoles and corolla. *Petiole* 2–3 in.; leaflets subcoriaceous, glabrous, oblong or obovate-oblong, 3–5 in. long, grey beneath. *Calyx* $\frac{3}{4}$ in. long, veined like the stipules bracts and bracteoles; teeth lanceolate, acuminate. *Pod* 2 in. long, flattish, 6–8-seeded.

SUBGEN. 2. **Neurocarpum.** *Pod* turgid, with a rib along the face of the valves.

5. **C. cajanæfolia,** *Benth. in Mart. Fl. Bras.* xv. 121. Neurocarpum cajanæfolium, *Presl, Symb.* 17, t. 9. N. retusum, *Hassk. Pl. Jav. Rar.* 376.

MALACCA and SINGAPORE, *G. Thomson, Griffith,* &c.—DISTRIB. Java, Trop. America.

A suberect undershrub, with terete pilose branches. *Leaflets* 3, obovate or oblanceolate, subcoriaceous, 2–5 in. long, obtuse, grey-canescent beneath; petiole scarcely any. *Flowers* usually 2, distinctly peduncled; bracteoles small, ovate or lanceolate. *Calyx* $\frac{3}{4}$ in.; teeth much shorter than the tube. *Corolla* pale violet, twice the calyx or more; standard $1\frac{1}{2}$ in. broad.

77. DOLICHOS, Linn.

Twining herbs, with stipellate 3-foliolate leaves and minute subpersistent bracts bracteoles and stipules. *Flowers* racemose or axillary. *Calyx-tube* campanulate; teeth long or short. *Corolla* much exserted; its petals usually equal in length; keel obtuse or rostrate, not spiral. *Stamens* diadelphous; anthers uniform. *Ovary* nearly sessile, many-ovuled; style filiform or thickened upwards, bearded down the inner face or round the terminal stigma. *Pod* flat, linear or oblong, recurved.—DISTRIB. Species about 20, wide-spread in tropics of both hemispheres.

SUBGEN. 1. **Lablab,** *Savi.* *Style* thickened upwards, narrowed to the base, bearded down the inner edge.

1. **D. Lablab,** *Linn.*; *Roxb. Fl. Ind.* iii. 305; pod recurved-oblong 2–4-seeded, flowers middle-sized, pedicels short, keel narrow rostrate. *Bot. Mag.* t. 896. Lablab vulgaris, *Savi*; *DC. Prodr.* ii. 401; *Wall. Cat.* 5536; *W. & A. Prodr.* 250. Dolichos lignosus, *Linn.*; *Roxb. Fl. Ind.* iii. 307; *Bot. Mag.* t. 380. Lablab lignosus, *Grah. in Wall. Cat.* 5537. L. cultratus, *DC. Prodr.* ii. 402; *W. & A. Prodr.* 251. L. microcarpus, perennans, leucocarpus and nankinensis, *DC. loc. cit.* D. benghalensis, *Jacq. Hort. Vind.* t. 124. D. purpureus, *Linn.*; *Bot. Reg.* t. 830. D. festivus, *Wall. Cat.* 5551. D. cuspidatus, *Grah. in Wall. Cat.* 5566. D. Curtisii, *G. Don Gard. Dict.* ii. 357.

Wild and universally cultivated throughout India, ascending in the Himalayas to 6–7000 ft.—DISTRIB. Tropics of the Old World.

Subglabrous, wide-twining, perennial, or under cultivation annual. *Stipules* lanceolate, basifixed; leaflets as broad as long, always entire, acute, 2–6 in. long, broad ovate, membranous, rarely downy beneath. *Racemes* and peduncles each reaching $\frac{1}{2}$–$\frac{3}{4}$ ft. long; pedicels densely fascicled, $\frac{1}{8}$ or finally $\frac{1}{4}$ in.; bracteoles oblong, sometimes as long as the calyx. *Calyx* $\frac{1}{8}$–$\frac{1}{4}$ in.; teeth short, deltoid. *Corolla* red-

dish or white, $\frac{1}{2}$–$\frac{3}{4}$ in. *Pod* 1$\frac{1}{2}$–2 in. by $\frac{1}{2}$–$\frac{3}{4}$ in., tipped with the hooked persistent base of the style.—Roxburgh describes fully 13 cultivated varieties.

2. **D. bracteatus,** *Baker*; flowers large, pedicels exceeding the calyx, keel broad subobtuse, pod linear many-seeded.

Plains of CONCAN, *Stocks.*

A robust glabrous perennial twiner. *Stipules* $\frac{1}{2}$ in., lanceolate, basifixed; leaflets entire, membranous, glabrous, acute or obtuse, $\frac{1}{2}$–$\frac{3}{4}$ ft. long, and broad, the base deltoid. *Racemes* long-peduncled, reaching a foot or more long; bracts minute, linear-lanceolate, deciduous; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in.; bracteoles firm, oblong or roundish, as long as the calyx. *Calyx* $\frac{1}{4}$ in., glabrous; teeth deltoid, short. *Corolla* reddish, 1 in. long. *Pod* much recurved, 5–6 in. by $\frac{3}{8}$ in., 10–12-seeded.

SUBGEN. 2. **Macrotyloma,** *W. & A.* *Style* filiform, minutely penicillate round the stigma, not bearded down the edge.—Connects *Phaseoleæ* and *Galactieæ.*

3. **D. biflorus,** *Linn.*; *DC. Prodr.* ii. 398; leaflets entire, flowers 1–3 in the axils of the leaves, calyx-teeth long setaceous, corolla yellow, pod linear downy 5–6-seeded. *Roxb. Fl. Ind.* iii. 313. D. uniflorus, *Lam.*; *DC. Prodr. loc. cit.*; *Wall. Cat.* 5538; *W. & A. Prodr.* 248. Johnia congesta, *Dalz. & Gibs. Bomb. Fl. Suppl.* 23. Glycine uniflora, *Dalz. in Journ. Linn. Soc.* xiii. 146, *cum icone.*

HIMALAYAS to CEYLON and BIRMA, ascending to 3000 ft. in SIKKIM, sometimes cultivated.—DISTRIB. Everywhere in tropics of Old World.

Annual, suberect (*D. uniflorus*) or lengthened out and twining (*D. biflorus*), downy, rarely glabrescent. *Stipules* basifixed, $\frac{1}{4}$ in., lanceolate, scariose; leaflets membranous, ovate, acute, 1–2 in. long, at first finely pilose on the faces. *Flowers* 1–3 together, in the axils of the leaves, without a common peduncle. *Calyx* $\frac{1}{4}$ in., downy; teeth lanceolate-setaceous, much exceeding the tube. *Corolla* $\frac{1}{2}$–$\frac{3}{4}$ in. long; keel narrow, obtuse, rather shorter than the standard. *Pod* 1$\frac{1}{2}$–2 in. by $\frac{1}{4}$–$\frac{1}{3}$ in., much recurved, tipped with the persistent style.

4. **D. lanceolatus,** *Grah. in Wall. Cat.* 5547; leaflets entire, flowers 1–2 on a short common peduncle in the axils of the leaves, calyx-teeth shorter than the tube, corolla reddish.

BIRMA; Prome hills, *Wallich.*

Stems very slender, wide-twining, with only a few short adpressed hairs. *Stipules* minute, lanceolate; leaflets 1–1$\frac{1}{2}$ in. long, moderately firm, oblong, acute, with a few adpressed hairs on both sides, narrowed to a rounded base. *Pedicels* shorter than the calyx; bracteoles ovate, persistent, rather shorter than the calyx. *Calyx* under $\frac{1}{4}$ in., silky. *Corolla* 3 times the calyx; petals subequal; keel distinctly incurved at the tip, subobtuse. *Style* rather thickened upwards, so that it connects the two sections. *Pod* unknown.

5. **D. ciliatus,** *Klein*; *DC. Prodr.* ii. 398; leaflets entire conspicuously ciliated on the edge, flowers 3–6 in subsessile cymes, calyx-teeth setaceous, corolla yellow, pod linear-oblong glabrous 3–4-seeded. *Wall. Cat.* 5558; *W. & A. Prodr.* 249. D. prostratus, *Kœnig*; *Roxb. Fl. Ind.* iii. 310.

Plains of the WESTERN PENINSULA and CEYLON.

Root tuberous, perennial. *Stems* slender, firm, clothed with short spreading deciduous grey hairs. *Stipules* small, nervose, lanceolate, basifixed; leaflets oblong, rounded at the base, 1–3 in. long, with only a few adpressed hairs at first on the faces. *Pedicels* shorter than the calyx; bracteoles minute, ovate, nervose, persistent. *Calyx* under $\frac{1}{4}$ in.; lower teeth lanceolate-setaceous. *Corolla* $\frac{1}{2}$ in.; standard as in *Clitoria*, much

exceeding the wings and keel. *Pod* 1–1½ in. by ½ in., tipped with the hooked base of the style.

6. **D. falcatus,** *Klein*; *DC. Prodr.* ii. 398; leaflets entire or slightly 3-lobed, flowers 2–8 on a short common peduncle, calyx-teeth deltoid, corolla yellow, pod linear glabrous 6–8-seeded. *Roxb. Fl. Ind.* iii. 311; *W. & A. Prodr.* 249. D. trilobatus. *Wall. Cat.* 5541, *non Linn.*

Himalayas, from KUMAON to KHASIA, ascending to 7500 ft. Plains of WESTERN PENINSULA and CEYLON.

Root tuberous, perennial. *Stems* wide-twining, very slender, pilose or glabrescent. *Stipules* small, lanceolate, reflexed, persistent; leaflets membranous, 1–3 in. long, ovate, acute, entire or obtuse, 3-lobed, finely pilose on the faces, or nearly glabrescent. *Peduncles* 1–2 in. long, sometimes scarcely any; pedicels $\frac{1}{12}$–$\frac{1}{8}$ in. *Calyx* glabrous, under ¼ in.; teeth very short. *Corolla* twice the calyx, its petals nearly equal in length; keel broad, obtuse. *Pod* substipitate, 2–3 in. by ⅜ in., slightly recurved.

DOUBTFUL SPECIES.

D. SUBCARNOSUS, *W. & A. Prodr.* 249, is a plant from the Western Peninsula, of which the flower is unknown and of which the place is therefore doubtful. It has small ovate acute entire leaflets, many-flowered distinctly-peduncled racemes, and a narrow linear nearly straight glabrous many-seeded pod 3–4 in. long.

D. SUBÆQUALIS, *Grah. in Wall. Cat.* 5539, is another doubtful plant, of which the flower is unknown, gathered by Wallich in Ava, which has been referred through some confusion to *Psophocarpus palustris*, from which it totally differs. It has slender terete woody suberect stems, with short deflexed deciduous grey pubescence, caducous stipules, membranous stipellate leaflets with a few adpressed bristly hairs on both sides, the end one oblong subobtuse or cuspidate 4–5 in. long, many-flowered short-peduncled racemes and a 2–3-seeded ligulate flattish pod ¾–1 in. by ¼ in., thinly clothed with long adpressed grey hairs, faintly depressed between the seeds.

78. PSOPHOCARPUS, Neck.

Twining herbs, with large tuberous roots. *Leaves* 3-foliolate, stipellate; stipules fastened above the base. *Flowers* rather large, lilac. *Calyx* teeth shorter than the tube, the two upper connate. *Corolla* much exserted, the petals equal in length; keel much incurved, but not beaked. *Stamens* monadelphous, the upper free downwards; anthers uniform. *Ovary* substipitate, many-ovuled; style long, much recurved, flattened laterally, densely bearded round the terminal stigma. *Pod* square, with a distinct wing to each angle, distinctly septate between the seeds.—DISTRIB. Species 3–4, all tropical in the Old World.

1. **P. tetragonolobus,** *DC. Prodr.* ii. 403; leaflets entire ovate membranous, racemes few-flowered, pedicels elongated, bracteoles much shorter than the calyx, pod large glabrous. *W. & A. Prodr.* 252; *Hassk. Pl. Jav. Rar.* 388. Dolichos ovatus, *Grah. in Wall. Cat.* 5540. D. tetragonolobus, *Linn.*; *Roxb. Fl. Ind.* iii. 305.

PROME and MARTABAN, *Wallich*, perhaps only introduced. Cultivated elsewhere.

Root large, annual. *Stems* weak, wide-twining, glabrous. *Stipules* lanceolate each way from the attachment; leaflets broad, ovate, acute, 3–6 in. long, 2–6 in. broad, glabrous, base subdeltoid. *Racemes* lax; peduncles ¼–½ ft.; pedicels geminate, as long as the calyx; bracteoles ovate, ⅛ in. *Calyx* ½ in., glabrous; side-teeth oblong; lowest shorter, deltoid. *Pod* ½–¾ ft. by 1 in., the wings ⅛–¼ in. broad, usually much crisped and toothed.

2. **P. palustris,** *Desv. in Ann. Sc. Nat.* ix. 420; leaflets ovate entire or lobed, racemes many-flowered, pedicels short, bracteoles as long as the calyx, pod small glabrous. Dolichos suffultus, *Grah. in Wall. Cat.* 5564. P. longepedunculatus, *Hassk. Pl. Jav. Rar.* 388. P. palmettorum, *Guill. & Per. Fl. Seneg.* 222. Diesingia scandens, *Endl. Atakt.* 1, t. 1–2.

Cultivated in the tropics of both hemispheres; a native of Africa.

Stems slender, glabrous, firmer than in the last. *Stipules* similar; leaflets broad ovate or roundish, 2–4 in. long, acute, sometimes with two distinct obtuse lobes in the lower half. *Racemes* long-peduncled, $\frac{1}{4}$–$\frac{1}{2}$ ft. long, dense upwards; bracteoles oblong, glabrous, quite enveloping the young calyx. *Pod* 2–4 in. long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad, including the wings, 4–8-seeded.

We have what may prove a third species from ASSAM, *Masters*, with pubescent stems and leaves, entire lanceolate subcoriaceous prominently-veined leaflets 4–5 in. long, short sessile racemes, a straight square 6–8-seeded pod 2–2$\frac{1}{2}$ in. long, with much less prominent wings than in the preceding, the faces densely clothed, with persistent firm short spreading grey hairs. Flowers, stipules, and bracteoles unknown.

79. ATYLOSIA, W. & A.

Herbs or shrubs, erect or twining. *Leaves* 3-foliolate, sometimes subdigitate, often exstipellate, gland-dotted beneath. *Flowers* axillary or racemed. *Calyx* teeth distinct, longer or shorter than the tube, the lowest the longest. *Corolla* more or less exserted, marcescent or caducous; keel not beaked. *Stamens* diadelphous; anthers uniform. *Ovary* sessile; ovules 3 or more; style filiform, incurved, glabrous, stigma capitate. *Pod* linear or oblong, turgid, marked with transverse lines between the seeds, which have a conspicuous divided strophiole.—DISTRIB. Species about 20, spread from India to Australia and Mauritius. Differs from *Cajanus* mainly by its arillate seeds.

SUBGEN. 1. **Atylia,** Benth. *Petals* marcescent, remaining till the pod is developed.

* *Erect. Flowers in sessile or stalked pairs. Pod not distinctly lineate between the seeds.*

1. **A. Candollei,** *W. & A. Prodr.* 257; petiole short, leaflets obovate-oblong or oblanceolate densely silky reticulato-venose beneath, pairs of flowers usually stalked, corolla large, pod 3–4-seeded densely silky. *Wight Ic.* t. 754. A. major, *W. & A. Prodr.* 257. Collæa trinervia, *DC. Mem. Leg.* p. 247, t. 41; *Prodr.* ii. 240; *Wall. Cat.* 5571. Odonia trinervia, *Spreng. Syst. Suppl.* 279. Rhynchosia Wightiana, *Grah. in Wall. Cat.* 5500.

NILGHIRIS and CEYLON, up to 4000 ft.

An erect shrub, with rigid sulcate branches, densely clothed with grey or brownish subpatent hairs. *Stipules* lanceolate, minute, silky, caducous; petioles $\frac{1}{4}$–$\frac{1}{2}$ in.; leaflets very thick and coriaceous, almost digitate, 2–3 times as long as broad, shortly pubescent above, the underside with the veins and veinlets in relief, densely clothed with thick grey or brownish silky pubescence, usually obtuse, the end one 1–3 in. long. *Peduncles* rigid, erecto-patent, of the lower pairs of flowers 1–2 in. long, of the upper often suppressed; bracteoles oblong, caducous; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. *Calyx* $\frac{1}{2}$–$\frac{3}{4}$ in., densely silky; lowest tooth linear, twice the tube, the others lanceolate. *Corolla* reddish, 1 in. long; limb of standard oblong; keel with a short obtuse beak. *Pod* straight, oblong, 1–1$\frac{1}{2}$ in. by $\frac{1}{2}$ in., densely clothed with soft short spreading grey or pale brown silky pubescence.

2. **A. geminiflora,** *Dalz. in Journ. Linn. Soc.* xiii. 185; petiole produced,

leaflets orbicular thinly hispid on both surfaces, flowers in stalked pairs, corolla small, pod hispid 5–7-seeded.

WESTERN INDIA, *Dalzell.*

Branches suberect, flexuose, clothed with spreading fulvous hairs. *Petiole* 3 in.; leaflets membranous, 3-nerved, pellucido-punctate, with scattered golden glands, 1½–2½ in. long; stipules acuminate from a broad auricled base. *Calyx* tomentose; teeth acuminate, twice as long as the tube. *Corolla* ½ in. long. *Pod* almost membranous, rounded at both ends, 1–1½ in. by ½ in., its hairs bulbous at the base. *Ex Dalz. loc. cit.*

3. **A. lineata,** *W. & A. Prodr.* 258; petiole short, leaflets obovate-oblong pilose beneath not reticulato-venose, pairs of flowers not peduncled, corolla small 3 times the calyx, pod 2–3-seeded finely pilose. Cajanus lineatus, *Grah. in Wall. Cat.* 5578. Atylosia Lawii, *Wight Ic.* t. 93; *Dalz. & Gibs. Bomb. Fl.* 74.

Hills of the WESTERN PENINSULA.

An erect shrub, with long straight sulcate branchlets, densely clothed with short grey pubescence. *Stipules* minute, setaceous; petiole ¼–¾ in.; leaflets subcoriaceous, greenish and thinly pilose above, densely shortly grey-downy below, triplinerved, nearly digitate, obtuse, the end one ¾–1½ in. long. *Pedicels* as long as the calyx. *Calyx* ⅙–⅕ in., densely downy; teeth deltoid-cuspidate, the lowest as long as the tube. *Corolla* twice the calyx; keel obtuse. *Pod* oblong, straight, ½–¾ in. by ¼ in., thinly clothed with fine spreading grey hairs.

4. **A. sericea,** *Benth. MSS.*; petiole short, leaflets oblanceolate silky on both surfaces especially beneath, pairs of flowers not peduncled, corolla small 3 times the calyx, pod small densely pilose 2-seeded.

CONCAN, *Stocks, Law, Ritchie.*

An erect shrub, with long straight terete branches, with many grooves, densely clothed with fine short whitish subpatent silky hairs. *Stipules* setaceous, subpersistent, ¼–½ in.; petiole ½–1 in.; leaflets flexible, moderately thick, subdigitate, 6–8 times as long as broad, subacute, triplinerved, persistently grey-silky, 1–2 in. long. *Pedicels* very short. *Calyx* ⅛ in., silvery; teeth lanceolate, as long as the tube. *Corolla* ⅜ in., red; keel with a short obtuse beak. *Pod* oblong, ⅜ in. long, densely softly persistently grey-downy.

** *Twiners with flowers in lax peduncled racemes and distinctly lineate pods.*

5. **A. mollis,** *Benth. Pl. Jungh.* 243; branches and leaves beneath shortly densely grey-downy, stipules minute caducous, end-leaflet short-stalked, pod persistently grey-canescent. Collæa mollis, *Grah. in Wall. Cat.* 5574. C. cinerascens, *Grah. in Wall. Cat.* 5575. Dolichos reticulatus, *Ham. in Wall. Cat.* 5552. D. crassus, *Grah. in Wall. Cat.* 5553. D. blandus, *Grah. in Wall. Cat.* 5568. Dunbaria Horsfieldii, *Miq. Flor. Ind. Bat.* i. 179. Atylosia glandulosa, *Dalz. in Journ. Linn. Soc.* 13, 185. Cajanus glandulosus, *Dalz. & Gibs. Bomb. Flora,* 73.

Himalayas, from GARWHAL and KUMAON to NIPAL, ascending to 5–6000 ft. CONCAN, *Stocks, Dalzell.* AVA, *Wallich.* PEGU, *McClelland.*—DISTRIB. Malay and Philippine isles.

Branches firm, slender, terete, glabrescent. *Petioles* 1–2 in.; leaflets coriaceous, shortly pilose, greenish above, densely persistently grey-downy beneath, finally reticulato-venose, distinctly stipellate, the end one 2–4 in. long, roundish-obovate, cuspidate, spathulately narrowed to a rounded base. *Racemes* 2–3 in. long, lax, short-peduncled; pedicels geminate, ¼–½ in.; bracteoles large, roundish, reddish, forming a conspicuous tuft before the racemes expand. *Calyx* ⅜ in., finely grey-downy; lowest tooth lanceolate, as long as the tube. *Corolla* yellow, twice the calyx. *Pod* straight, 1–2 in.

by $\frac{3}{8}$ in., 4–9-seeded, rounded at both ends.—*Dolichos blandus* is an imperfect flowering specimen, without locality, which resembles this closely as far as it goes, but has a much smaller corolla and shorter calyx-teeth.

6. **A. villosa,** *Benth. MSS.*; branches and leaves below thinly grey-downy, stipules minute caducous, end-leaflet short-stalked, pod densely clothed with long spreading hairs.

Lower hills of SIKKIM, alt. 4000 ft., *Hook. fil.*

Known only from two flowerless examples, which as far as they go differ from the last principally in the vestiture of the pod. *Leaflets* subcoriaceous, obovate-cuspidate; petiole $\frac{1}{2}$ in. *Pedicels* decurved, finally $\frac{1}{4}$ in. long. *Pod* 1–1$\frac{1}{4}$ in. long, $\frac{3}{8}$ in. broad, 5–6-seeded, densely clothed with persistent fine spreading pale brown silky hairs, rounded at both ends, tipped with the persistent pilose base of the style.

7. **A. kulnensis,** *Dalz. in Journ. Linn. Soc.* xiii. 186; branches thinly clothed with fine spreading hairs, leaflets subglabrous, the end one short-stalked, stipules membranous subpersistent, pod clothed with long spreading hairs. Cajanus kulnensis, *Dalz. in Kew. Journ.* ii. 264; *Dalz. & Gibs. Bomb. Flora,* 72.

CONCAN, near Kulna, in the Warree Country, *Stocks, Law, Dalzell.*

Branches firm, slender, terete, glabrescent. *Stipules* ovate-lanceolate, $\frac{1}{6}$–$\frac{1}{4}$ in.; petiole 1–2 in.; leaflets thin, but firm, green on both sides, with a few obscure hairs on the ribs below, scabrous with glands above, the end one obovate-rhomboid cuspidate, 1$\frac{1}{2}$–3 in. long; stipellæ subulate, persistent. *Racemes* lax, short-peduncled, few-flowered; pedicels $\frac{3}{8}$–$\frac{1}{2}$ in.; bracteoles round, enclosing the buds. *Calyx* $\frac{1}{2}$ in., finely downy, lowest tooth linear-acuminate, exceeding the tube. *Corolla* half as long again as the calyx. *Pod* 1$\frac{1}{2}$ in. by $\frac{3}{8}$–$\frac{1}{2}$ in., 5–6-seeded, marked with distinct oblique depressed lines.

8. **A. grandiflora,** *Benth. MSS.*; branches minutely downy, stipules minute caducous, leaflets membranous glabrous the end one long-stalked, pod clothed with fine spreading silky hairs.

KUMAON; Bagesar, alt. 3000 ft., *Strachey* and *Winterbottom.* UPPER GARWHAL, *Madden.*

Branches terete, firm, slender, glabrescent. *Petioles* 2–3 in.; leaflets thin, green on both sides, minutely hairy on the ribs beneath, the end one obovate-cuspidate, rounded at the base, 3–4 in. long; petiolule $\frac{3}{4}$ in. long; stipellæ distinct, setaceous. *Racemes* lax, few-flowered; pedicels finally $\frac{3}{8}$–$\frac{1}{2}$ in., recurved. *Calyx* $\frac{3}{4}$–$\frac{7}{8}$ in., finely downy: lowest tooth linear-setaceous, 3–4 times the tube; the others lanceolate. *Corolla* slightly exceeding the calyx. *Pod* 1$\frac{1}{2}$–2 in. by $\frac{1}{2}$ in., 5–6-seeded.

SUBGEN. 2. **Cantharospermum,** *W. & A. Petals* falling before the pod developes.

* *Leaflets subdigitate.*

9. **A. nivea,** *Benth. Pl. Jungh.* 243; shrubby, erect, leaflets obovate obtuse rigidly coriaceous white-canescent beneath, racemes few-flowered short-peduncled, calyx-teeth short, corolla much exserted, pod 4–6-seeded canescent. Cajanus niveus, *Grah. in Wall. Cat.* 5581.

BIRMA; Prome and near Zeranghuen, *Wallich.*

Very like *A. albicans,* with which Wight and Arnott join it, but suberect, not twining. *Branches* slender, woody, terete, grey-canescent. *Petiole* 1 in.; leaflets exstipellate, rigidly coriaceous, 1 in. long, rounded at both ends, thinly grey-canescent above, densely beneath. *Racemes* falling short of the leaves, subcorymbose; pedicels cernuous, $\frac{1}{4}$–$\frac{1}{3}$ in. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., finely downy; all the teeth deltoid. *Corolla* 4 times as long as the calyx; keel obtuse. *Pod* 1–1$\frac{1}{4}$ in. by $\frac{1}{2}$ in., distinctly lineate, firm, rounded at both ends.

10. **A. albicans,** *Benth. Pl. Jungh.* 243; a shrubby twiner, leaflets obovate obtuse or subacute rigidly coriaceous white-canescent beneath, racemes lax short-peduncled, calyx-teeth short, corolla much exserted, pod 5–6-seeded thinly canescent. Cantharospermum albicans, *W. & A. Prodr.* 256, *excl. syn.* Cajanus albicans, *Grah. in Wall. Cat.* 5582. C. Wightianus, *Grah. in Wall. Cat.* 5583.

Hills of the WESTERN PENINSULA and CEYLON.

Branchlets slender, thinly canescent, with many grooves. *Stipules* minute, caducous; petiole 1–2 in.; leaflets 1–2 in. long, densely finely persistently white-canescent beneath, not reticulato-venose, greenish and obscurely canescent above, much narrowed in the lower half, the base subdeltoid, or a little rounded. *Racemes* 4–12-flowered, often corymbose, usually shorter than the leaves; bracts small, round, silvery on the back, caducous; pedicels $\frac{1}{4}$–$\frac{1}{5}$ in. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., thinly canescent; lowest tooth lanceolate, upper oblong or deltoid. *Corolla* 3 times as long as the calyx. *Pod* 1–1$\frac{1}{2}$ in. by $\frac{3}{8}$–$\frac{1}{2}$ in., straight, distinctly lineate, narrowed to the base, beaked with the base of the style.

11. **A. elongata,** *Benth. Pl. Jungh.* 243; a slender herbaceous twiner, leaflets membranous obovate-cuspidate obscurely hairy beneath, racemes 2–4-flowered long-peduncled, calyx-teeth long, corolla little exserted, pod 3–4-seeded glabrescent. Dolichos elongatus, *Grah. in Wall. Cat.* 5543.

NIPAL, KHASIA and ASSAM, ascending to 6000 ft.

Stems very slender, wide-twining, clothed with fine spreading grey hairs. *Stipules* minute, caducous; petiole 1–4 in.; leaflets greenish on both sides, paler and inconspicuously pilose on the ribs below, always pointed, 1–1$\frac{1}{2}$ in. long, narrowed from the middle to a rather rounded base, exstipellate. *Peduncles* 1–2 in.; pedicels as long as the calyx. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in., densely pubescent; lower tooth setaceous, twice the tube, the others similar but shorter. *Corolla* scarcely exceeding the calyx. *Pod* oblong, $\frac{3}{4}$ in. long by half as broad, narrowed to the base, distinctly lineate, beaked, clothed at first with short spreading hairs.

12. **A. rugosa,** *W. & A. Prodr.* 257; a woody twiner, leaflets thick obovate obtuse densely grey-canescent reticulato-venose below, flowers usually in stalked pairs, calyx-teeth long, corolla little exserted, pod 3–4-seeded densely canescent. Rhynchosia velutina, *Grah. in Wall. Cat.* 5501.

NILGHIRIS and CEYLON, ascending to 6000 ft.

Branches slender, sulcate, densely shortly grey-downy. *Stipules* minute, ovate, caducous; petiole $\frac{1}{2}$–1$\frac{1}{2}$ in.; leaflets coriaceous, flexible, rugose on both sides, rounded at the base, 1–2 in. long, grey, thinly canescent above, densely persistently grey-canescent below, with the veinlets in relief, exstipellate. *Peduncles* $\frac{1}{2}$–1$\frac{1}{2}$ in., the flowers rarely 4 to each; pedicels as long as the calyx; bracts small, round, thick, caducous. *Calyx* $\frac{1}{4}$–$\frac{3}{8}$ in., densely canescent; lower tooth linear, exceeding the tube, the others lanceolate. *Corolla* half as long again as the calyx. *Pod* $\frac{3}{4}$–1 in. by $\frac{3}{8}$ in., densely grey-canescent, rounded at both ends.

13. **A. scarabæoides,** *Benth. Pl. Jungh.* 243; a herbaceous twiner, leaflets obovate-oblong subcoriaceous downy beneath, corymbs few-flowered short-peduncled, calyx-teeth long, corolla little exserted, pod 4–6-seeded clothed with fine spreading hairs. Dolichos scarabæoides, *Linn. Sp.* 1020. Cajanus scarabæoides, *Thouars*; *Grah. in Wall. Cat.* 5580. Rhynchosia scarabæoides, *DC. Prodr.* ii. 387. R. biflora, *DC. loc. cit.* Cantharospermum pauciflorum, *W. & A. Prodr.* 255; *Dalz. & Gibs. Bomb. Fl.* 73.

Universally spread in the plains throughout India, reaching 5–6000 ft. in the West Himalayas.—DISTRIB. China, Malaya, Mauritius, Madagascar.

A biennial, with slender trailing or twining densely grey-downy stems. *Stipules* minute, caducous; petiole $\frac{1}{2}$–1 in.; leaflets 1$\frac{1}{2}$ in. long, flexible, twice as long as broad,

exstipellate, obtuse or subacute, triplinerved in the lower half, thinly grey-canescent above, densely beneath, with usually only the main nerves raised. *Peduncles* short, densely pubescent, 2–6-flowered; pedicels as long as the calyx. *Calyx* $\frac{1}{5}$–$\frac{1}{4}$ in., densely grey-silky; teeth linear, the lowest twice as long as the tube. *Corolla* yellow, $\frac{1}{3}$–$\frac{3}{8}$ in.; keel abruptly incurved at the tip. *Pod* straight, distinctly lineate, $\frac{3}{4}$–1 in. by $\frac{1}{4}$ in., clothed with fine spreading grey or pale brown silky hairs.—*C. nervosum*, Royle MSS., is a form with thick leaves, with the veinlets raised on the under side. The descriptions of *Dolichos scarabæoides* and *medicagineus* in Roxburgh, Flora Indica, iv. 315, have been accidentally transposed.

** *Petiolule of the end leaflet elongated.*

14. **A. platycarpa,** *Benth. Pl. Jungh.* 243; a herbaceous twiner, leaflets exstipellate membranous roundish both surfaces finely pilose, flowers 1–2 peduncled, calyx-teeth long, corolla little exserted, pod straight thinly pilose 5–7-seeded. Cantharospermum? distans, *Royle MSS.*

CENTRAL HIMALAYAS, GARWHAL, &c., alt. 1–8000 ft.

Branches very slender, climbing or trailing, densely clothed with short spreading grey hairs. *Petioles* 1–4 in; stipules minute, linear, caducous; leaflets round-cuspidate, 1–3 in. long and broad, greenish on both surfaces, paler beneath; petiolule $\frac{1}{2}$–$\frac{3}{4}$ in. *Peduncles* shorter than the petioles, suppressed at the end of the shoots, where the leaves also are much reduced; pedicels as long as the calyx. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in., densely pilose; teeth linear-setaceous. *Pod* flat, 1–1$\frac{3}{4}$ in. by $\frac{1}{2}$ in., distinctly lineate, clothed with fine short deciduous spreading hairs.

15. **A. rostrata,** *Baker*; a woody climber, branches glabrescent, leaflets exstipellate roundish subcoriaceous obscurely canescent below, flowers in long-peduncled lax racemes, calyx-teeth short, corolla much exserted, pod bristly recurved 8–10-seeded.

CONCAN, *Stocks.*

Branches firm, terete, at first minutely downy. *Stipules* minute, caducous; petiole 1–3 in.; leaflets as broad as long, 3–4 in. each way, green and glabrous above, narrowed to a deltoid point, suddenly narrowed in the lower third or quarter; petiolule 1 in. *Racemes* overtopping the leaves, the flowers much the most showy in the genus; pedicels $\frac{1}{2}$–$\frac{5}{8}$ in. *Calyx* $\frac{3}{8}$ in., broadly campanulate, with only a few deciduous bristles, all the teeth shorter than the tube. *Corolla* 1 in. long; keel broad, beaked; limb of standard 1$\frac{1}{4}$ in. broad. *Pod* linear, distinctly lineate, 2$\frac{1}{2}$–3 in. long, $\frac{3}{8}$ in. broad, narrowed at the tip, thinly clothed with stiff grey bristles with bulbous bases.

17486 16. **A. barbata,** *Baker*; a woody climber, branches densely pubescent, leaflets roundish stipellate subcoriaceous thinly shortly pubescent, flowers in long-peduncled racemes, calyx-teeth long, corolla little exserted, pod straight densely pilose 5–6-seeded. A. goensis, *Dalz. in Journ. Linn. Soc.* xiii. 186. Dunbaria barbata, *Benth. Pl. Jungh.* 242. D. calycina, *Miq. Fl. Ind. Bat.* i. 180. Dolichos barbatus, *Wall. Cat.* 5548. D. ornatus, *Wall. Cat.* 5561. Rhynchosia vestita, *Wall. Cat.* 5505. Cajanus goensis, *Dalz. in Kew Journ.* ii. 264; *Dalz. & Gibs. Bomb. Fl.* 73.

ASSAM, MARTABAN, TENASSERIM, CONCAN.—DISTRIB. Java.

Branches firm, densely clothed at first with short spreading grey pubescence. *Stipules* $\frac{1}{4}$ in., lanceolate, caducous; petiole 1–4 in.; leaflets 3–4 in. broad and long, cuspidate, broadly rounded at the base, green above, paler and greyer beneath, both surfaces minutely permanently pubescent; petiolule $\frac{1}{4}$–1 in.; stipellæ minute, setaceous. *Peduncles* often overtopping the leaves; racemes at first close, finally 4–6 in. long, the rachis densely pilose; bracts roundish or ovate, with a cusp, shaggy, exceeding the buds; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in. *Calyx* $\frac{1}{2}$ in., shaggy; teeth lanceolate, exceeding the tube. *Standard* half as long again as the calyx; keel equalling the calyx $\frac{1}{2}$ in. broad. *Pod* 1$\frac{1}{2}$–2 in. by $\frac{3}{8}$ in., straight, densely clothed with long grey spreading hairs, narrowed to both ends.

80. **CAJANUS,** DC.

An erect shrub. *Leaves* 3-foliolate. *Flowers* racemed. *Calyx-tube* campanulate; teeth short. *Corolla* much exserted, its petals equal in length; keel truncate. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, few-ovuled; style long, filiform, much upcurved, stigma capitate. *Pod* linear, straight, narrowed at both ends, 3–5-seeded, torulose with oblique linear depressions between the non-strophiolate seeds.—DISTRIB. The only species.

1. **C. indicus,** *Spreng. Syst.* iii. 248; *W. & A. Prodr.* 256. C. bicolor, *Wall. Cat.* 5577. C. flavus and bicolor, *DC. Prodr.* ii. 406. Cytisus Cajan, *Linn.*; *Roxb. Fl. Ind.* iii. 325. C. pseudo-cajan, *Jacq. Hort. Vind.* t. 119.—*Rheede Hort. Mal.* vi. t. 13.

Wild? and cultivated throughout our limits, ascending to 6000 ft. in the Himalayas.—DISTRIB. Everywhere in the tropics, probably native of the Old World.

An erect shrub, with slender sulcate grey-silky branchlets. *Stipules* minute, lanceolate; leaflets 3, minutely stipellate, oblong-lanceolate, entire, subcoriaceous, thinly silky above, densely beneath, indistinctly gland-dotted. *Flowers* in sparse distinctly-peduncled corymbose racemes, often forming a terminal panicle; pedicels downy, 2–3 times the calyx. *Calyx* $\frac{1}{4}$ in. *Corolla* 3 times the calyx: standard yellow, (*C. flavus*) or beautifully veined with red (*C. bicolor*). *Pod* 2–3 in. by $\frac{1}{4}$–$\frac{1}{2}$ in., finely downy, tipped with the lower half of the style.

81. **DUNBARIA,** W. & A.

Woody or herbaceous climbers. *Leaves* 3-foliolate, distinctly gland-dotted beneath; stipellæ rarely present. *Flowers* racemose or axillary. *Calyx-teeth* long and narrow, the lowest distinctly exceeding the others. *Corolla* more or less exserted, marcescent or caducous; keel usually not beaked. *Stamens* diadelphous, anthers uniform. *Ovary* sessile or stalked, many-ovuled; style inflexed, filiform beardless, stigma capitate. *Pod* linear, flat, not marked with depressed lines between the substrophiolate seeds.—DISTRIB. Three more species, reaching North Australia and Japan.

SUBGEN. 1. **Eudunbaria,** *Benth.* *Corolla* large, marcescent, lasting till the pod reaches full size.

1. **D. ferruginea,** *W. & A. Prodr.* 258; stems closely pubescent, stipules minute caducous, leaflets thick as broad as long densely pubescent beneath, standard exceeding the wings and keel, pod puberulent. Collæa venosa, *Grah. in Wall. Cat.* 5573. C. gibba, *Grah. in Wall. Cat.* 5572, *B.C.* Dunbaria latifolia, *W. & A. Prodr.* 258.

Hills of WESTERN PENINSULA and CEYLON.

A woody twiner, with slender stems and densely downy branchlets and petioles. *Leaflets* roundish-deltoid, entire, coriaceous, 2–3 in. long, glabrescent or thinly downy above, clothed with soft grey or ferruginous pubescence beneath; stipellæ sometimes present. *Racemes* lax, many-flowered, distinctly peduncled; pedicels downy, geminate, $\frac{1}{2}$–$\frac{3}{4}$ in.; bracts large, boat-shaped, soon falling. *Calyx* $\frac{1}{2}$–$\frac{5}{8}$ in., densely downy; lower tooth linear, as long as the tube, the others lanceolate. *Corolla* 1–1$\frac{1}{4}$ in. long, the standard 1 in. broad, exceeding the wings and keel, $\frac{1}{4}$–$\frac{1}{3}$ in. *Pod* sessile, straight, 1$\frac{1}{2}$–2 in. by $\frac{3}{8}$–$\frac{1}{2}$ in., 4–5-seeded, tipped with the hooked base of the style.

2. **D. Heynei,** *W. & A. Prodr.* 258; stems thinly clothed with fine spreading hairs, stipules membranous persistent, leaflets thin twice as long as

broad subglabrous, petals subequal, pod clothed with fine spreading hairs. Collæa gibba, *Grah. in Wall. Cat.* 5572 A. Dunbaria oblonga, *Arn. in Nov. Act. Nat. Cur.* xviii. 333.

Hills of MYSORE and CEYLON, up to 3000 ft.

A woody climber, with slender terete glabrescent stems and petioles. *Stipules* lanceolate, $\frac{1}{4}$–$\frac{1}{3}$ in.; leaflets green on both surfaces, with a few minute deciduous hairs, membranous, the end one nearly sessile, obovate-oblong, cuspidate, 3–6 in. long; stipellæ minute, caducous. *Racemes* few-flowered, lax, distinctly peduncled; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in.; bracteoles large, oblong, caducous. *Calyx* $\frac{1}{3}$–$\frac{3}{8}$ in., finely downy; lowest tooth acuminate, exceeding the tube. *Corolla* twice the calyx; standard $\frac{3}{4}$ in. broad; keel subtruncate. *Pod* 1$\frac{1}{2}$–2 in. by $\frac{1}{2}$ in., straight, densely pilose at first, 4–5-seeded.

3. **D. pulchra,** *Benth. MSS.*; stems finely downy, stipules caducous, leaflets thin twice as long as broad obscurely downy, standard exceeding the wings and keel, pod clothed with fine spreading hairs.

Lower hills of SIKKIM, 1–2000 ft., *Hook. fil.*

A woody climber, with slender terete glabrescent branches. *Leaflets* membranous, green, glabrescent above, greyish-puberulent beneath, the end one oblong, narrowed to a rounded base, and a long point, distinctly petioled, 3–4 in. long, stipellate. *Racemes* few-flowered, lax, distinctly peduncled; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in.; bracteoles large, navicular, caducous. *Calyx* finely downy, $\frac{3}{4}$ in. long; lower tooth setaceous, 2–3 times the tube, the others much shorter, lanceolate. *Corolla* 1–1$\frac{1}{4}$ in. long; limb of standard round. *Pod* as in the last.

SUBGEN. 2. **Rhyncolobium,** *Benth.* *Corolla* small, caducous, little exserted.

4. **D. debilis,** *Baker*; stems filiform, leaflets subcoriaceous ligulate-oblong obtuse 3–4 times as long as broad, flowers solitary in the axils of the leaves, pod sessile glabrous.

KHASIA Mts., alt. 4–5000 ft., *Hook. fil. & Thomson, Lobb.*

A twining herb, with very slender finely downy stems and distant nodes. *Stipules* minute, setaceous, persistent; petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; leaflets grey-green, thinly canescent above, densely so beneath, prominently nerved, the end one short-petioled, rounded at both ends, 1–1$\frac{1}{4}$ in. long. *Pedicels* as long as the calyx. *Calyx* $\frac{1}{4}$ in., grey-downy; teeth linear, the lowest as long as the tube. *Corolla* yellowish, half as long again as the calyx. *Pod* recurved, glabrescent, 1$\frac{1}{2}$–2 in. by $\frac{1}{4}$ in., 8–10-seeded.

5. **D. conspersa,** *Benth. Pl. Jungh.* 241; stems filiform, leaflets membranous round-rhomboid, flowers 1–2 together in the axils of the leaves usually not peduncled, pod sessile glabrous. Dolichos conspersus, *Grah. in Wall. Cat.* 5542. D. rhynchosioides, *Miq. Flor. Ind. Bat.* i. 185. D. punctatus, *W. & A. Prodr.* 247. D. Finlaysonianus, *Grah. in Wall. Cat.* 5565. Atylosia punctata, *Dalz. in Journ. Linn. Soc.* xiii. 186.

EASTERN HIMALAYAS, tropical region; SILHET and ASSAM. WESTERN PENINSULA, *Wight.* PROME, *Wallich.*—DISTRIB. Malaya, China, N. Australia.

A twining herb, with very slender finely-downy stems. *Stipules* minute, linear; petiole 1 in.; leaflets thin, flexible, green, glabrescent above, pale green, obscurely downy, distinctly gland-dotted beneath, not stipellate; end one distinctly petioled, 1–1$\frac{1}{2}$ in. long and broad, subacute. *Pedicels* very short; flowers rarely 3–4 on a short peduncle. *Calyx* $\frac{1}{4}$ in., grey-downy; lowest tooth as long as the tube. *Corolla* reddish, $\frac{3}{8}$–$\frac{1}{2}$ in.; keel distinctly beaked. *Pod* linear, 1$\frac{1}{2}$–2 in. by $\frac{1}{3}$ in., recurved, 6–8-seeded.—The Japanese *Atylosia subrhombea* and Javan *Dolichos truncatus* of Miquel both belong to this section of *Dunbaria,* and are near this species.

6. **D. podocarpa,** *Kurz in Journ. Asiat. Soc. Beng.* xliii. 2, 185; stems herbaceous, leaflets broad ovate acuminate, flowers in pairs in the axils of the leaves on a very short peduncle, pod puberulous distinctly stalked.

TENASSERIM, *Kurz.*

A perennial twiner, with fine yellowish pubescence. *Petiole* ½–1 in.; leaflets puberulous, pale beneath. *Pedicels* pubescent, ⅙ in. *Calyx* ¼ in., with adpressed yellowish pubescence; teeth lanceolate. *Corolla* middle-sized. *Pod* 1½–2 in. by ⅓ in., flat, acuminate, many-seeded; stalk ⅜ in.—Ex Kurz loc. cit.

7. **D. circinalis,** *Baker*; stems woody slender, leaflets thin broad-ovate acute, flowers many in close subsessile racemes, pod distinctly stalked clothed with fine spreading hairs. Phaseolus circinalis, *Ham. in Wall. Cat.* 5594, *ex parte.* Atylosia circinalis, *Benth. Pl. Jungh.* 244.

MOULMEIN, *Griffith.* TENASSERIM, *Helfer.* ASSAM, *Wallich.*

A slender woody climber, with terete glabrescent branches, finely grey-downy at first. *Stipules* minute, caducous; leaflets flexible, green, glabrescent above, finely grey-downy beneath, obscurely stipellate; the end one acuminate, distinctly stalked, 1–1½ in. long and broad, broadly rounded at the base. *Racemes* 6–10-flowered, shorter than the leaves; pedicels short, densely grey-downy. *Calyx* ⅓ in.; lowest tooth lanceolate, as long as the tube. *Corolla* little exserted; keel with a recurved beak. *Pod* incurved, 2–3 in. by ⅜ in., 8–10-seeded, with a stalk ¼–½ in. long.—The Wallichian specimen includes the pod of a true *Phaseolus.*

82. CYLISTA, Ait.

A climbing shrub. *Leaves* 3-foliolate. *Flowers* racemed. *Calyx-tube* campanulate; teeth scariose and persistent, the lowest much the largest boat-shaped, the two side ones smaller than the two upper. *Corolla* enclosed in the calyx, the petals equal in length; keel much incurved, truncate. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, 1-ovuled; style long, filiform, stigma capitate. *Pod* small, oblique, oblong, enclosed in the calyx.—DISTRIB. The only species. Differs from *Rhynchosia* only by its peculiar calyx.

1. **C. scariosa,** *Ait.*; *DC. Prodr.* ii. 410: *Roxb. Cor. Pl.* i. t. 92; *Fl. Ind.* iii. 320; *Wall. Cat.* 5586; *W. & A. Prodr.* 259; *Wight Ic.* t. 1597; *Dalz. & Gibs. Bomb. Fl.* 74.

Woods of CONCAN, DECCAN, CANARA, and ORISSA.

A woody twiner, with slender finely downy branches. *Leaflets* minutely stipellate, subcoriaceous, ovate or subrhomboidal, acute, 2–4 in. long, thinly grey-downy above, densely downy below. *Flowers* in copious distinctly-peduncled lax or dense racemes; bracts large, membranous, ovate, caducous; pedicels short, densely pubescent. *Corolla* yellowish-red, ½ in. long. *Calyx* finally 1–1¼ in. long, the scariose conspicuously veined lower lip 1 in. broad.

83. ERIOSEMA, DC.

Shrubs or herbs, mostly suberect, with 1–3-foliolate leaves. *Flowers* racemed or axillary. *Calyx* campanulate; teeth 5, as long as the tube. *Corolla* distinctly exserted; limb of standard roundish, auricled at the base; wings and slightly beaked keel shorter. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, 2-ovuled; style filiform, glabrous, stigma capitate. *Pod* oblong, turgid, 1–2-seeded; seeds oblique, the funiculus attached to the extremity of a linear hilum.—DISTRIB. Species about 50, mostly Trop. African and American.

1. **E. chinense,** *Vogel, Pl. Meyen.* 31. Crotalaria tuberosa, *Hamilt. in Don Prodr.* 241. Rhynchosia virgata, *Grah. in Wall. Cat.* 5503. R. Grahami, *Wall. Cat.* 5504. Pyrrotrichia tuberosa, *W. & A. Prodr.* 238.

Himalayas from KUMAON and GURWHAL to KHASIA and ASSAM, ascending to

6000 ft. CEYLON, *Walker.* MALACCA, *Griffith.* PEGU, *McClelland.*—DISTRIB. China, Philippines, N. Australia.

Root a small woody perennial tuber. *Stems* 1–2 ft., slender, erect, woody, little branched, densely pubescent. *Stipules* linear, persistent; leaflets short-petioled, simple, linear-ligulate, 1–2 in. long, subcoriaceous, greenish with a few adpressed hairs above, glaucous, densely grey-canescent, brown on the ribs beneath. *Flowers* 1–2, short-peduncled, in leaf-axils. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in., densely pilose. *Corolla* twice the calyx, yellowish, purple-black when dried. *Pod* oblong, $\frac{3}{8}$ in., densely pubescent.

84. **RHYNCHOSIA,** Lour.

Twining or erect herbs or shrubs. *Leaves* pinnately 3-foliolate, gland-dotted beneath; stipellæ present or absent; stipules and bracts caducous. *Flowers* axillary or racemed. *Calyx-tube* short; teeth equalling or often much exceeding it, usually not accrescent, slightly so in § *Phyllomatia,* the upper often more or less connate. *Corolla* included or exserted; keel incurved, not distinctly beaked. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, usually 2-ovuled; style long, filiform, much incurved, stigma capitate. *Pod* round or oblong, flattish or turgid, usually continuous between the seeds, the hilum parallel with the sutures and funiculus centrical upon it.—DISTRIB. Species about 80, spread everywhere in the tropics and reaching the Cape and United States.

SUBGEN. 1. **Phyllomatia,** *W. & A.* Calyx-teeth broad and marcescent, but not so excessively enlarged as in *Cylista,* in which Graham placed the species. *Seeds* with a large grooved white waxy arillus, as in *Atylosia.*

1. **R. rufescens,** *DC. Prodr.* ii. 387; pedicels distinct solitary distant, calyx-lobes narrowed to an obtuse point, pod globose one-seeded. *W. & A. Prodr.* 239; *Hook. Ic. Pl.* t. 189. Glycine rufescens, *Willd. Nov. Act. Ber.* 1803, p. 222. G. pondicheriensis, *Spreng. Syst.* iii. 196. Cylista suaveolens, *Grah. in Wall. Cat.* 5587. Cyanospermum javanicum, *Miq. Flor. Ind. Bat.* i. 167. Lespedeza indica, *Spreng. Syst.* iii. 202; *W. & A. Prodr.* 231. Hallia trifoliata, *Roth Nov. Sp.* 352. Flemingia Rothiana, *DC. Prodr.* ii. 351.

Plains of WESTERN PENINSULA and CEYLON. DACCA, *Clarke.* KHASIA, *Griffith.*—DISTRIB. Java.

Suberect, shrubby, with long trailing shoots, clothed with fine short grey pubescence. *Petioles* erecto-patent, 1–2 in.; stipules minute, caducous; leaflets subcoriaceous, minutely stipellate, ovate or oblong, 1–3 in. long, acute, rounded at the base, minutely pubescent, the end one distinctly stalked. *Racemes* nearly sessile, laxly 2–6-flowered; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in., cernuous. *Calyx* downy, $\frac{3}{8}$ in. deep, cut down nearly to the base into 5 subequal scariose lobes $\frac{1}{8}$–$\frac{1}{6}$ in. broad. *Corolla* not exserted. *Pod* $\frac{1}{4}$–$\frac{3}{8}$ in. long, roundish, turgid, finely downy.

2. **R. Heynei,** *W. & A. Prodr.* 240; flowers scarcely pedicellate geminate or ternate, calyx-lobes lanceolate narrowed at the base, pod two-seeded twice as long as broad. Cylista reticulata, *Heyne in Wall. Cat.* 5584. R. coodoorensis, *Bedd. Ic. Pl. Ind. Or.* t. 297.

Plains of MYSORE, *Heyne.* NILGHIRIS, *Beddome.*

Shrubby, with densely shortly grey-downy elongated slender branches. *Stipules* minute, caducous; petiole 1–$1\frac{1}{2}$ in.; leaflets oblong, acute, rounded at the base, subcoriaceous, minutely pubescent, the end one 2–3 in. long, distinctly stalked. *Flowers* in short-peduncled 2–4-nate racemes of 1–2 distant clusters. *Calyx* $\frac{1}{2}$–$\frac{5}{8}$ in., downy;

lobes subacute, rounded at the base, $\frac{1}{6}$–$\frac{1}{5}$ in. broad. *Corolla* included. *Pod* oblong, $\frac{1}{2}$ in. long, obliquely lineate, minutely pubescent.

SUBGEN. 2. **Nomismia,** *W. & A.* Trailing herbs with narrow setaceous or acuminate calyx-teeth. Seeds with a waxy arillus.

3. **R. nummularia,** *DC. Prodr.* ii. 386; annual, leaflets green on both surfaces finely pubescent broader than long, racemes elongated few-flowered, calyx-teeth as long as the tube, pod globose 1-seeded. *Wall. Cat.* 5493. Glycine nummularia, *Linn. Mant.* 571. Nomismia nummularia, *W. & A. Prodr.* 237; *Wight Ic.* t. 283.

Plains of the WESTERN PENINSULA and CEYLON.

Stems trailing to a length of 2–3 ft., clothed with fine grey spreading hairs. *Stipules* minute, ovate; petiole 1–6 in.; leaflets subcoriaceous, 1–2 in. broad, truncate or emarginate, glabrescent above, finely pubescent on the edge and lower surface, the end one distinctly-stalked, broadly deltoid at the base. *Racemes* 2–6-flowered, distinctly peduncled, equalling or exceeding the leaves; pedicels geminate, very short, cernuous. *Calyx* $\frac{1}{6}$ in. long, densely pubescent; teeth lanceolate. *Corolla* $\frac{1}{4}$ in. *Pod* $\frac{1}{2}$ in. each way, plicate, lenticular, clothed with fine deciduous hairs.

4. **R. aurea,** *DC. Prodr.* ii. 386; annual, leaflets green on both surfaces finely pubescent obovate-rhomboidal, racemes close many-flowered, calyx-teeth 3–4 times as long as the tube, pod globose 2-seeded. R. elongata, *DC. loc. cit.* R. densiflora, *Wall. Cat.* 5492 *D.* R. capitata, *DC. Prodr. loc. cit.* Glycine aurea, *Willd. in Nov. Act. Ber.* iv. 1803, 18. G. elongata, *Roth. Nov. Sp.* 347. G. capitata, *Heyne in Roth. Nov. Sp.* 346. Dolichos rufescens, *Grah. in Wall. Cat.* 5544. Nomismia aurea, *W. & A. Prodr.* 237. N. capitata, *W. & A. Prodr.* 237; *Wight Ic.* t. 295.

Plains from the foot of the HIMALAYAS to CEYLON.

Stems wide-trailing, very slender, clothed with fine spreading hairs. *Stipules* minute, lanceolate, caducous; petiole 1–3 in.; leaflets subcoriaceous, as long as broad, $\frac{1}{2}$–2 in. each way, glabrescent above, obscurely pilose below, broadly deltoid at both ends, exstipellate, the end one distinctly stalked. *Racemes* short-peduncled, 6–30-flowered, about on a level with the leaves; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in., densely pubescent. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in., densely pubescent; teeth setaceous, the lowest the longest. *Corolla* bright yellow, scarcely exserted. *Pod* membranous, subcompressed, $\frac{3}{8}$–$\frac{1}{2}$ in. each way, with a faint line between the seeds, thinly clothed with fine spreading hairs.

5. **R. filipes,** *Benth. in Hohen. Pl. Ind. Or. Exsic.* No. 1184; perennial, leaflets thick obovate white-canescent reticulato-venose beneath, flowers peduncled solitary, calyx-teeth as long as the tube, pod oblong two-seeded.

NILGHIRIS.

Stems woody in the lower part, wide-trailing, slender, densely tomentose. *Stipules* minute, lanceolate; petiole under 1 in.; leaflets coriaceous, very thick, $\frac{1}{2}$–1 in. long, greenish, obscurely canescent above, covered with persistent thick white tomentum below, the end one short-stalked, obtuse, with a minute mucro, rounded at the base. *Flowers* on thread-like pedicels $\frac{1}{8}$–1 in. long, with a persistent silky lanceolate bract a short distance below the calyx. *Calyx* $\frac{1}{6}$–$\frac{1}{4}$ in., densely silky; teeth lanceolate. *Corolla* little exserted. *Pod* $\frac{1}{2}$ in. long by half as broad, finely downy, reticulato-venose, not lineate between the seeds.

SUBGEN. 3. **Ptychocentrum,** *W. & A.* Erect undershrubs, with lanceolate acuminate calyx-teeth. Seeds with a waxy arillus.

6. **R. suaveolens,** *DC. Prodr.* ii. 387; leaves minutely downy, flowers in peduncled pairs casually solitary, calyx-teeth twice the tube, corolla half as long again as the calyx, pod minutely downy lineate externally septate in-

ternally. *W. & A. Prodr.* 240. Glycine suaveolens, *Linn. Suppl.* 326. Cajanus suaveolens, *Grah. in Wall. Cat.* 5579.

Plains of CEYLON and both sides of the WESTERN PENINSULA.

An undershrub, 1–3 ft. high, with many stiff erecto-patent branches, clothed with fine short grey pubescence, sometimes lengthened out and half twining at the ends. *Stipules* minute, lanceolate; petiole 1–2 in., stiffly erecto-patent; leaflets almost membranous, pale green, minutely downy, especially beneath, sometimes stipellate, the end one roundish, with a long cusp, distinctly stalked, 1–3 in. long. *Peduncles* slender, erecto-patent, downy, seldom above 1 in.; pedicels shorter than the calyx. *Calyx* $\frac{1}{4}$ in., downy; teeth linear-setaceous. *Pod* oblong, $\frac{1}{2}$–$\frac{3}{4}$ in. long, turgid, 2-seeded.

7. **R. cana,** *DC. Prodr.* ii. 386; leaves minutely downy, flowers in peduncled pairs, calyx-teeth exceeding the tube, corolla twice the calyx, pod minutely downy neither lineate externally nor septate internally. *Wall. Cat.* 5498; *W. & A. Prodr.* 240. Glycine cana, *Willd. Sp.* iii. 1063.

Plains of CEYLON, and both sides of the WESTERN PENINSULA.

A dwarf undershrub, with very numerous erecto-patent slender shortly downy branchlets. *Petioles* 1–2 in. long, erecto-patent; leaflets obovate or oblong, obtuse or subacute, thicker in texture and deeper in colour than in the last, thinly pilose above, densely or thinly grey downy beneath, 1–2 in. long, exstipellate, the end one distinctly stalked. *Peduncles* slender, $\frac{1}{8}$–1 in.; pedicels shorter than the calyx, with a small persistent lanceolate bract at the base. *Calyx* $\frac{1}{6}$ in., densely silky. *Pod* oblong, $\frac{1}{2}$–$\frac{3}{4}$ in. long, turgid, glabrescent, 2-seeded.

8. **R. avensis,** *Benth. MSS.*; leaflets densely tomentose beneath, flowers in peduncled racemes, lowest calyx-tooth 3–4 times as long as the tube, pod densely hairy lineate externally not septate internally. Cajanus candicans, *Wall. Cat.* 5576. Atylosia candicans, *Kurz in Journ. Asiat. Soc. Beng.* xliii. 2, 186.

AVA; Taongdong, *Wallich.* PEGU, near Rangoon, *McClelland.*

Branches slender, woody, virgate, densely clothed with grey tomentum. *Stipules* caducous; petiole 1–2 in., stiffly erecto-patent; leaflets thick, coriaceous, greenish, thinly canescent above, densely persistently thickly grey-canescent beneath, the end one ovate-acuminate, 3–4 in. long. *Peduncles* equalling or exceeding the petioles; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in.; bracts lanceolate, caducous. *Calyx* $\frac{1}{2}$–$\frac{3}{4}$ in., densely silky; all the teeth linear-setaceous, the lowest the longest. *Corolla* not exserted. *Pod* oblique, oblong, firm, $\frac{1}{2}$–$\frac{5}{8}$ in. long, 2-seeded.

9. **R. Beddomei,** *Baker*; leaflets argenteo-canescent on both sides, flowers in subsessile congested racemes, calyx-teeth much exceeding the tube, corolla not exserted.

WESTERN PENINSULA; Cudrapo hills, *Beddome.*

An erect shrub, with terete white-canescent branches. *Petioles* erecto-patent, $\frac{1}{2}$–$\frac{3}{4}$ in.; leaflets oblong or oblong-lanceolate, acute, subcoriaceous, thinly persistently argenteo-canescent above, densely so beneath, the veins conspicuously raised, the end one short-stalked. *Flowers* in copious cymes from the axils of reduced leaves; pedicels much shorter than calyx. *Calyx* $\frac{3}{8}$ in., thinly silky. *Corolla* bright yellow. *Pod* 1-seeded, not seen fully mature, oblong, thinly canescent.

SUBGEN. 4. **Cyanospermum,** *W. & A.* A woody twiner with broad foliaceous calyx-teeth. Seeds without an arillus.

10. **R. cyanosperma,** *Benth. in Oliv. Flor. Trop. Africa,* ii. 218. Cyanospermum tomentosum, *W. & A. Prodr.* 260; *Wight Ill.* t. 81 (84); *Dalz. &*

Gibs. Bomb. Fl. 75. Cylista tomentosa, *Roxb. Cor. Pl.* iii. t. 221; *Hort. Beng.* 55; *Fl. Ind.* iii. 319; *DC. Prodr.* ii. 410; *Wall. Cat.* 5585. Cylista albiflora, *Bot. Mag.* t. 1859.

Jungles of the WESTERN PENINSULA and CEYLON.—DISTRIB. Mascaren isles, Zambesi-land.

A robust woody climber, with stems clothed with short grey or brown pubescence. *Leaflets* subcoriaceous, flexible, softly pilose on both sides, 4–6 in. long, the end one ovate-cuspidate, distinctly stalked; stipellæ large, setaceous, persistent. *Racemes* close, distinctly peduncled, ½–1 ft. long; bracts large, round-cuspidate, caducous. *Calyx* membranous, ¾ in. long, densely clothed with grey hairs; tube short, teeth ⅛–⅙ in. broad. *Corolla* included, marcescent, bright red or white. *Pod* as long as the calyx, deeply torulose, persistently grey-canescent; seeds large, globose, shining, violet-black.

SUBGEN. 5. **Pseudo-cajan,** *Benth.* An erect shrub with narrow acuminate calyx-teeth. Seeds without an arillus.

11. **R. pseudo-cajan,** *Camb. in Jacq. Voy. Bot.* 45, t. 55. R. incana, *Royle MSS.*

Western Himalayas; HAZARA to GURWHAL and KUMAON, ascending to 9000 ft.

An erect shrub, 4–6 ft. high, with virgate slender branches, clothed with persistent fine grey tomentum. *Petiole* ½–1 in.; stipules minute, caducous; leaflets subcoriaceous, 1–2 in. long, exstipellate, grey-green, thinly canescent above, densely persistently grey-canescent beneath, with raised veinlets; the end one oblong-rhomboidal, distinctly stalked, apex deltoid, subacute. *Flowers* in short-peduncled close corymbs; pedicels shorter than the calyx. *Calyx* ⅜ in., densely grey-canescent; lowest tooth linear-setaceous, exceeding the tube; the others shorter, lanceolate. *Corolla* ½–⅝ in.; standard thinly silky. *Pod* oblong, an inch long, ⅜ in. broad, straight, hard, persistently grey-canescent, subcompressed, bearing 1–2 seeds in the upper half.

SUBGEN. 6. **Eurhynchosia,** *W. & A.* Twining herbs or shrubs with acuminate calyx-teeth. Seeds without an arillus.

* *Leaflets small, subcoriaceous or membranous, usually obtuse. Pod much exceeding the calyx* (Copisma, *E. Meyer*).

12. **R. minima,** *DC. Prodr.* ii. 385; stems and leaves nearly or quite glabrescent, leaflets as broad as long deltoid in the lower half, racemes lax elongated, calyx-teeth exceeding the tube, pod 3–4 times the calyx small. R. medicaginea, *DC. Prodr.* ii. 386; *W. & A. Prodr.* 238; *Dalz. & Gibs. Bomb. Fl.* 74. R. rhombifolia, *DC. Prodr. loc. cit.* R. prostrata, *Grah. in Wall. Cat.* 5496. R. microphylla, *Wall. Cat.* 5497. R. nuda, *DC. Prodr.* ii. 385; *W. & A. Prodr.* 238; *Wall. Cat.* 5494. R. ervoidea, *DC. loc. cit.* Glycine rhombifolia, *Willd. Sp.* iii. 1065. Dolichos minimus, *Linn. Sp. Pl.* 1020. D. medicagineus, *Lam. Dict.* ii. 297; *Roxb. Hort. Beng.* 55.

Everywhere in the plains, from the HIMALAYAS, where it ascends to 4000 ft., to CEYLON and BIRMA.—DISTRIB. Cosmopolitan in the Tropics, Cape, United States.

A twining or wide-trailing annual, with very slender stems, with only a little short pubescence at the beginning. *Stipules* minute, lanceolate, caducous; leaflets subcoriaceous or membranous, ¼–1 in. broad and deep, obtuse, usually exstipellate, the end one distinctly stalked, mostly conspicuously gland-dotted beneath. *Racemes* 6–12-flowered, short-peduncled, usually exceeding the leaves; bracts minute, linear; pedicels short. *Calyx* ⅛–⅙ in., pubescent; lowest tooth setaceous, twice the tube. *Corolla* yellow, twice the calyx. *Pod* ½–⅝ in. long, under ¼ in. broad, glabrescent, turgid, slightly recurved, mostly 2-seeded.

VAR. *laxiflora*; glabrous, leaflets larger 1½–2 in. long acute both the upper and

lower half subdeltoid, racemes laxer 2–4 or even 6 in. long. R. laxiflora, *Camb. in Jacquem. Voy. Bot.* 44, t. 54. R. Candollei, *Decne.*; *Miq. Flor. Ind. Bat.* i. 170. R. tenuicaulis, *Wall. Cat.* 5495. R. filicaulis, *Grah. in Wall. Cat.* 5502. Dolichos fatmensis, *Hochst. & Steud. in Schimp. Arab. Exsic.* No. 873.

13. **R. Memnonia,** *DC. Prodr.* 386; stems and leaves clothed with minute persistent grey pubescence, leaflets as broad as long obtuse deltoid in the lower half, flowers few in lax racemes, calyx-teeth exceeding the tube, pod small 3–4 times the calyx. *Boiss. Fl. Orient.* ii. 625. R. pulverulenta, *Stocks in Hook. Kew Journ.* iv. 147; *Boiss. Fl. Orient. loc. cit.* Glycine Memnonia, *Delile Fl. Ægypt.* 100, t. 38, fig. 3.

SCINDE, near Kurrachee, *Stocks.*—DISTRIB. Arabia, Trop. Africa.

Scarcely more than a variety of the preceding, from which it only differs in vestiture.

14. **R. velutina,** *W. & A. Prodr.* 233; young branches minutely downy, leaflets thinly grey-canescent beneath as broad as long obtuse deltoid in the lower half, racemes 2–4-flowered cymose, calyx-teeth equalling or exceeding the tube, pod middle-sized 4–5 times the calyx.

NILGHIRIS.

Stems wide-trailing, rather stouter than in *R. minima*, glabrescent when mature. *Stipules* minute, linear, caducous; leaflets subcoriaceous, $\frac{1}{2}$–$1\frac{1}{2}$ in. long and broad, green, glabrous above, persistently thinly grey-canescent beneath, exstipellate, the end one distinctly stalked. *Cymes* 2–4-flowered, shorter than the leaves; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in., finely silky; lowest tooth linear-setaceous, twice the tube, the others much shorter, lanceolate. *Corolla* $\frac{1}{2}$ in. *Pod* much recurved, 1–$1\frac{1}{4}$ in. by $\frac{3}{8}$ in., glabrescent, 2-seeded, narrowed very gradually to the base.

15. **R. pilosa,** *Wall. Cat.* 5499; branches and leaves clothed with long fine spreading grey hairs, leaflets oblong rounded at the base, racemes short few-flowered, calyx-teeth with long setaceous points exceeding the tube.

BIRMA; banks of the Irrawaddi at Segaen, *Wallich.*

Stems very slender, twining. *Stipules* linear, $\frac{1}{8}$ in., subpersistent; leaflets subcoriaceous, grey-green above, grey beneath, clothed on the edge and below with conspicuous long fine hairs, exstipellate, the end one oblong or ovate-oblong, rounded at both ends, $1\frac{1}{2}$–2 in. long. *Racemes* like those of *R. minima*, the buds like dense tufts of silky hairs; pedicels shorter than the calyx; bracts minute, lanceolate. *Calyx* $\frac{1}{4}$ in., all the teeth with long setaceous points. *Corolla* half as long again as the calyx. *Pod* unknown.

16. **R. Falconeri,** *Baker*; branches and leaves clothed with short spreading grey hairs, leaflets ovate-oblong rounded at both ends, racemes long-peduncled lax few-flowered, lowest calyx-tooth linear exceeding the tube, pod middle-sized 4–5 times the length of the calyx.

GURWHAL, *Falconer.*

Stems wide-trailing, slender, densely clothed with short firm deflexed grey hairs. *Stipules* $\frac{1}{8}$–$\frac{1}{4}$ in., subpersistent, linear or lanceolate; petiole 1–2 in.; leaflets subcoriaceous, 1–$1\frac{1}{2}$ in. long, rounded to both ends, greenish beneath, thinly clothed on both sides with persistent moderately firm grey hairs, exstipellate, the end one distinctly stalked. *Racemes* 4–6-flowered; peduncles much exceeding the leaves; pedicels shorter than the calyx. *Calyx* pilose, $\frac{1}{5}$ in.; teeth linear. *Corolla* half as long again as the calyx; standard slightly pilose. *Pod* 1 in. by $\frac{3}{8}$ in., finely pubescent, 2-seeded.

** ***Leaflets larger, flexible, not coriaceous, mostly acute. Pod much exceeding the calyx.***

17. **R. viscosa,** *DC. Prodr.* ii. 387; pubescence minutely glandular, end-leaflet acute as broad as long, pedicels very short, lowest calyx-tooth as long as the tube much shorter than the corolla. R. stipulosa, *A. Rich. Fl. Abyss.* i. 229, t. 43. R. villosula, *Thwaites Enum.* 412. Dolichos glutinosus, *Roxb. Fl. Ind.* iii. 312; *Wall. Cat.* 5560; *W. & A. Prodr.* 248.

Plains from the HIMALAYAS to CEYLON.—DISTRIB. Malaya, Trop. Africa, Mauritius, Madagascar.

Stems rather woody, wide-twining, clothed with deciduous fine short grey viscous pubescence. *Stipules* small, deltoid, subpersistent; leaflets green on both surfaces, finely gland-dotted, often glabrescent, 1½–3 in. long, the apex deltoid, the base broadly rounded, sometimes faintly 3-lobed, rarely stipellate, the end one on a petiolule ½–¾ in. long. *Racemes* long-peduncled, lax, 2–4 in. long; pedicels $\frac{1}{12}$–⅛ in.; bracts minute, ovate-cuspidate, deciduous. *Calyx* ¼ in., finely gland-downy; upper teeth deltoid. *Corolla* twice the calyx. *Pod* 1¼ in. by ⅜ in., 2-seeded, turgid, finely pubescent, straight, tipped with the base of the style, narrowed to both ends.

18. **R. himalensis,** *Benth. MSS.*; pubescence fine glandular, end leaflets acute longer than broad, pedicels elongated, lower calyx-tooth as long as the corolla 3–4 times as long as the tube.

Western and Central Himalayas, alt. 3–7000 ft. HAZARA, SIMLA, GARWHAL, KUMAON, &c.

Stems wide-trailing, slender, terete, clothed with fine short grey viscous pubescence. *Stipules* lanceolate, ¼ in., subpersistent, reflexed; leaflets thin, finely pubescent on both surfaces, not at all coriaceous, a much paler green beneath than above, exstipellate, 2–3 in. long; the end one ovate-acuminate, distinctly stalked. *Racemes* 1–½ ft. long, lax, distinctly peduncled; pedicels ¼ in.; bracts ⅛–¼ in., oblong-lanceolate. *Calyx* ½ in., densely downy; lowest tooth linear-setaceous; the others lanceolate-setaceous, twice the tube. *Standard* glabrous, yellow, very conspicuously veined with purple. *Pod* 1–1¼ in. by ⅜ in., finely downy, 2-seeded, rather recurved, narrowed to both ends.

19. **R. sericea,** *Spanoghe in Linnæa,* xv. 195; pubescence dense soft spreading, end-leaflet rotundato-rhomboidal obtuse or subacute, pedicels short, lower calyx-tooth linear as long as the tube much shorter than the corolla. Dolichos tomentosus, *Roth Nov. Sp.* 345; *DC. Prodr.* ii. 401; *W. & A. Prodr.* 248. D. macrodon, *Grah. in Wall. Cat.* 5555.

Central and Western HIMALAYAS, ascending to 5–6000 ft., and hills of WEST PENINSULA.—DISTRIB. Malaya.

Stems woody, slender, wide-climbing, densely clothed with soft short spreading grey glandular hairs. *Stipules* lanceolate, ¼–⅜ in., subpersistent; leaflets not at all coriaceous, soft with dense short pubescence on both surfaces, sometimes stipellate, pale green both above and beneath, the end one distinctly stalked, deltoid at the tip, the lower half narrowed suddenly to a rather rounded base. *Racemes* many-flowered, moderately close, including the long peduncle reaching a foot in length; pedicels much shorter than the calyx; bracts lanceolate, silky, exceeding the buds. *Calyx* ¼–⅜ in., densely grey-silky; upper teeth deltoid-cuspidate, shorter than the tube. *Corolla* ½–⅝ in.; standard dark purple inside, callose, distinctly auricled, silky on the back. *Pod* 1–1¼ in. by ⅜ in., finely-pubescent, turgid, 2-seeded, rather recurved, tipped with the long persistent base of the style.

20. **R. bracteata,** *Benth. MSS.*; pubescence very short canescent not glandular, leaflets rotundato-rhomboidal cuspidate, pedicels short, lower calyx-tooth linear exceeding the tube shorter than the corolla. Dolichos bracteatus, *Wall. Cat.* 5554.

UPPER GANGETIC PLAIN, near Benares, *Madden.* BIRMA; Prome, Jenanghaen and Taong-dong, *Wallich.*

Branches twining or straight, woody, many-grooved, persistently pilose. *Stipules* minute, caducous; leaflets 2–4 in. long and broad, thick, subcoriaceous, green, thinly downy above, densely softly grey-downy beneath, exstipellate. *Racemes* moderately close, distinctly peduncled, much exceeding the leaves; pedicels shorter than the calyx. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in., densely downy; upper teeth deltoid or lanceolate, shorter than the tube. *Corolla* $\frac{1}{2}$ in.; standard canescent externally. *Pod* 1–1$\frac{1}{2}$ in. by $\frac{1}{2}$ in., turgid, 2-seeded, narrowed in the lower half, minutely downy.

21. **R. acutissima,** *Thwaites, Enum.* 413; pubescence short not glandular, leaflets oblong-rhomboidal, pedicels exceeding the calyx, lowest calyx-tooth lanceolate much shorter than the corolla.

TRAVANCOR, *Beddome*. CEYLON, near Hantani, alt. 3000 ft., *Thwaites*.

A twiner, with stems clothed with short pale brown tomentum. *Stipules* lanceolate, caducous; leaflets 2–5 in. long, very acuminate. *Racemes* equalling or shorter than the leaves; pedicels geminate, $\frac{1}{4}$–$\frac{1}{3}$ in. long; bracts lanceolate-acuminate, deciduous. *Calyx* $\frac{1}{4}$ in.; teeth lanceolate, the upper pair subconnate. *Corolla* $\frac{1}{2}$ in., yellow veined with red. *Ovary* 2-ovuled. *Pod* not seen.

*** *Leaflets not at all coriaceous. Calyx as long as the corolla, nearly as long as the pod.* (Arcyphyllum, *Elliott*).

22. **R. densiflora,** *DC. Prodr.* ii. 386; *Wall. Cat.* 5492, *excl. D.*; *W. & A. Prodr.* 239. Glycine densiflora, *Roth Nov. Sp.* 348. Hedysarum punctatum, *Rottl. in Berl. Mag.* 231, *non Poir.* Desmodium punctatum, *DC. Prodr.* ii. 338.

Plains of both sides of the WESTERN PENINSULA.—DISTRIB. Zambesi land.

Stems very slender, woody, wide-twining, finely grey-downy. *Stipules* minute, caducous; leaflets ovate-rhomboidal, obtuse or acute, 1–2 in. long, flexible, minutely grey-downy, especially below, sometimes stipellate, the end one short-stalked. *Flowers* 20–40 or more in dense nearly sessile heads usually shorter than the leaves; pedicels much shorter than the calyx; bracts linear, $\frac{1}{8}$–$\frac{1}{4}$ in., persistent. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in.; teeth all lanceolate acuminate; tube very short. *Corolla* glabrous. *Pod* oblong, $\frac{1}{2}$–$\frac{5}{8}$ in by $\frac{1}{4}$ in., 2-seeded, pubescent, oblique, narrowed suddenly at the tip.

DOUBTFUL SPECIES.

DOLICHOS CANDICANS, *Wall. Cat.* 5567, from Ava, belongs either to § 3 or 5, but the seed is not known. It has densely tomentose virgate branches, thick coriaceous obtuse leaflets rather broader than long densely persistently grey-tomentose on the lower side with the veinlets raised, the end one distinctly stalked 1–2 in. long, racemes short-peduncled closely few-flowered, small lanceolate bracts, pedicels shorter than the calyx, calyx densely grey-pubescent $\frac{3}{8}$ in. long, lowest tooth linear exceeding the tube, the others shorter, lanceolate, corolla scarcely exserted.

R. MOLLISSIMA, *Dalz. in Journ. Linn. Soc.* xiii. 186, from Kandesh, which I have not seen, is said to differ from *R. sericea* principally by the want of callosities and auricles to the standard.

85. FLEMINGIA, Roxb.

Shrubs, rarely herbs, with leaves digitately 3-foliolate or simple, gland-dotted below. *Inflorescence* various; pedicels very short, not bracteolate. *Calyx-tube* short; teeth narrow, acuminate, the lowest often the longest. *Corolla* little or not at all exserted; petals equal in length; keel obtuse or slightly rostrate. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, 2-ovuled; style filiform, beardless, stigma capitate. *Pod* oblong, turgid, small, usually two-seeded; seeds not strophiolate, the funicle centrical.—DISTRIB. Only 3 Trop. African species not here represented.

SUBGEN. 1. **Ostryodium,** *Desv.* Shrubs. *Leaves* simple. *Flowers* in

small cymes, each hidden by a large folded persistent bract, closely distichously arranged in copious simple or slightly branched racemes, both in the axils of the leaves and above them.

1. **F. strobilifera,** *R. Br. in Ait. Hort. Kew ed.* 2, iv. 350; leaves oblong subacute broadly rounded at the base, axis of racemes zigzag, bracts pointed or faintly emarginate. *DC. Prodr.* ii. 351; *Wall. Cat.* 5753; *W. & A. Prodr.* 243; *Wight Ic.* t. 267; *Dalz. & Gibs. Bomb. Fl.* 75. Hedysarum strobiliferum, *Linn. Sp.* 1053; *Roxb. Fl. Ind.* iii. 350. Zornia strobilifera, *Pers. Ench.* ii. 319. F. abrupta, *Wall. Cat.* 5755.

Himalayas from SIMLA and KUMAON, ascending to 8000 ft. to ASSAM, KHASIA. CHITTAGONG, SIAM, MALACCA, and CEYLON.—DISTRIB. Malayan Islands, Philippines, Timor. Introduced in Mauritius and West Indies.

An erect shrub, 5–10 ft. high. *Branches* slender, terete, velvety. *Leaves* subcoriaceous, 3–8 in. long, green, glabrescent above, thinly silky, especially on the raised parallel erecto-patent ribs below; stipules scariose, linear, $\frac{1}{4}$–$\frac{1}{2}$ in.; petiole stiffly erecto-patent, $\frac{1}{8}$–1 in. *Racemes* 3–6 in. long, usually simple, the slender zigzag rachis densely grey-downy; bracts erecto-patent, short-petioled, deeply cordate, $\frac{1}{2}$–1 in. long, membranous, finely downy, rather broader than long, obscurely cuspidate in the typical form. *Calyx* $\frac{1}{4}$ in., finely pilose; teeth lanceolate, exceeding the tube. *Corolla* purple, little exserted. *Pod* oblong, turgid, $\frac{1}{4}$–$\frac{3}{8}$ in. long, finely downy, 2-seeded.

VAR. 1. *bracteata*; racemes copious dense panicled, bracts slightly emarginate. F. bracteata, *Wight Ic.* t. 268; *Benth. Pl. Jungh.* 245. Hedysarum bracteatum, *Roxb. Fl. Ind.* iii. 351. F. chlorostachys, *Wall. Cat.* 5756.—Forests of East Himalayas and Birma.

VAR. 2. *fruticulosa*; habit low and branches trailing, leaves smaller plicate, racemes fewer-flowered, bracts $\frac{1}{2}$–$\frac{5}{8}$ in. slightly emarginate. F. fruticulosa, *Wall. Cat.* 5754; *Benth. Pl. Jungh.* 245.—Temperate region of Central Himalayas.

2. **F. Chappar,** *Ham. in Wall. Cat.* 5757; leaves rotundato-cordate cuspidate, rachis of racemes straight, bracts deeply emarginate. *Benth. Pl. Jungh.* 244.

EASTERN HIMALAYAS, *Hamilton.* BEHAR, *Dr. Hooker.* AVA, *Wallich.*

General habit and inflorescence just that of the last. *Branches* terete, with a thin coating of adpressed hairs. *Leaves* nearly as broad as long, subcoriaceous, 2–4 in. each way, green, glabrous above, minutely grey-downy below; petiole longer than in *F. strobilifera.* *Racemes* often panicled; rachis more woody than in the last, and the pubescence shorter; bracts firmer, less distinctly veined, much broader than long. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in.; teeth lanceolate, as long as the tube. *Corolla* twice the calyx. *Pod* as in the last.

SUBGEN. 2. **Chalaria,** *W. & A.* Erect shrubs. *Leaves* simple or 3-foliolate. *Bracts* minute, caducous. *Flowers* in lax panicled racemes.

3. **F. paniculata,** *Wall. Cat.* 5759; leaflets simple large cordate-ovate cuspidate thin not plicate, flowers mostly in a terminal panicle, bracts navicular as long as the calyx. *Benth. Pl. Jungh.* 245. F. Phursia, *Ham. in Wall. Cat.* 5758.

Central and Eastern Himalayas, tropical zone; from KUMAON to SIKKIM. MOULMEIN, *Helfer.*

An erect shrub, 4 to 6 ft. high, with finely downy slender terete branches. *Leaves* subcoriaceous, thin, full green above, paler beneath, glabrous except on the ribs of the undersurface, 3–6 in. long; petiole 1 in. or less long; stipules minute, lanceolate, caducous. Axillary *racemes* sometimes simple, sometimes fascicled, the end ones forming a thyrsoid panicle $\frac{1}{2}$ ft. long, with densely grey downy branches, rather laxly flowered nearly down to the base; bracts ovate, pilose, scariose; pedicels shorter than the calyx. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., densely grey-downy; teeth lanceolate, acuminate; tube very short. *Corolla* reddish, little exserted; keel rostrate. *Pod* $\frac{1}{2}$ in., oblong, finely downy, 2-seeded.

4. **F. lineata,** *Roxb. Hort. Beng.* 56; *Fl. Ind.* iii. 341; leaves 3-foliolate oblanceolate-oblong deeply plicate, flowers in copious axillary and terminal panicled racemes, bracts very minute linear. *Wall. Cat.* 5752; *DC. Prodr.* ii. 351; *W. & A. Prodr.* 242; *Wight Ic.* t. 327. Hedysarum lineatum, *Linn. Sp. Pl.* 1054. Lespedeza lineata, *Pers. Syn.* ii. 318.

Plains from the HIMALAYAS to CEYLON, BIRMA and SIAM.—DISTRIB. Malayan Islands, N. Australia.

An erect shrub, with the ultimate branchlets angular and grey-canescent. *Stipules* lanceolate, scariose, subpersistent, $\frac{1}{4}$–$\frac{3}{8}$ in.; petiole $\frac{1}{2}$–2 in., erecto-patent, deeply sulcate; leaflets rigidly subcoriaceous, 1–3 in. long, obtuse, or with a slight cusp, deltoid at the base, exstipellate, both surfaces especially the lower finely grey-canescent, sublucent. *Panicles* from the axils of most of the leaves, erecto-patent, 2–4 in. long, the flowers crowded towards the end of the branches and absent from the lower part; pedicels very short. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in., densely grey-downy; teeth lanceolate. *Corolla* little exserted; keel beaked. *Pod* $\frac{3}{8}$–$\frac{1}{2}$ in., finely downy, rounded at both ends, 2-seeded.

SUBGEN. 3. **Flemingiastrum,** DC. Erect shrubs. *Leaves* digitately 3-foliolate. *Flowers* in dense subspicate axillary racemes; bracts linear or lanceolate, caducous.

5. **F. stricta,** *Roxb. Cor. Pl.* iii. t. 248; *Hort. Beng.* 56; *Fl. Ind.* iii. 342; branches triquetrous, leaflets thin large acuminate obscurely silky on the ribs below, bracts linear firm much exceeding the buds, calyx silky. *DC. Prodr.* ii. 351; *Wall. Cat.* 5745, *excl. E*; *W. & A. Prodr.* 241; *Wight Ic.* t. 329.

Tropical regions of SIKKIM, SILHET, ASSAM; BIRMA, TENASSERIM, and the Western Peninsula.—DISTRIB. China.

A tall shrub, with woody triquetrous branches, clothed with only a few short adpressed hairs. *Stipules* large, lanceolate, rigidly scariose, soon falling; petiole 3–6 in., triquetrous, deeply sulcate, not winged; leaflets subcoriaceous, $\frac{1}{2}$–1 ft. long, oblong, narrowed to both ends, smooth and glabrous above, with only a few short obscure hairs on the ribs below. *Racemes* dense, oblong-cylindrical, often fascicled, 2–3 in. long, the lower bracts larger than the others and subpersistent, the upper ones rigidly scariose, linear, $\frac{1}{2}$–$\frac{3}{4}$ in. long, shortly silky, densely imbricated before the flowers expand; pedicels very short. *Calyx* $\frac{1}{4}$–$\frac{3}{8}$ in.; teeth linear, the lowest twice as long as the others. *Corolla* as long as the lower tooth, much exceeding the others; keel obtuse. *Pod* $\frac{1}{2}$–$\frac{5}{8}$ in. long, glabrescent.

VAR. *pteropus, Baker*; petiole distinctly winged, leaflets lanceolate acuminate plicate, spikes more slender densely fascicled, bracts and flowers smaller.—Pegu, *McClelland.*

6. **F. Grahamiana,** *W. & A. Prodr.* 242; branches subterete, leaflets obovate obtuse or subacute thinly silky below, bracts linear firm small, calyx shaggy. F. pycnantha, *Benth. in Hohen. Pl. Exsic.* No. 1211; *Pl. Jungh.* 245.

NILGHIRIS, *Wight, Gardner,* &c.

A low erect shrub, with tomentose young shoots. *Stipules* lanceolate, $\frac{1}{4}$–$\frac{1}{3}$ in., caducous; petiole $\frac{1}{2}$–1 in., erecto-patent, not winged; leaflets subcoriaceous, 2–3 in. long, plicate, glabrous above, grey-silky especially on the ribs beneath many of the veinlets raised. *Spikes* dense, oblong, 1–2 in. long, often fascicled; bracts under $\frac{1}{4}$ in. long, erecto-patent, subrigid, subpersistent. *Calyx* $\frac{3}{8}$ in.; teeth plumose, linear-setaceous, subequal. *Corolla* not exserted. *Pod* oblong, $\frac{3}{8}$ in. long, finely pubescent, and often covered with red viscous glands.

7. **F. congesta,** *Roxb. Hort. Beng.* 56; *Fl. Ind.* iii. 340; branches subterete, leaflets oblong acuminate silky on the ribs below, bracts neither rigid nor protruded, calyx silky. *DC. Prodr.* ii. 351; *Wall. Cat.* 5747, *in greater part*; *W. & A. Prodr.* 241; *Wight Ic.* t. 390; *Dalz. & Gibs. Bomb. Fl.* 75.

F. angustifolia, *Roxb. Fl. Ind.* iii. 341? Crotalaria macrophylla, *Willd. Sp.* iii. 982. Rhynchosia crotalarioides, *DC. Prodr.* ii. 387.

CENTRAL HIMALAYAS to CEYLON and MALACCA, in the tropical region.—DISTRIB. Malay isles, China, Philippines.

An erect woody shrub, 4–6 ft. high, with terete glabrescent old and rather angular sulcate silky young branches. *Stipules* linear, ½ in., caducous; petiole 1–4 in., sulcate down the face, not winged; leaflets subcoriaceous, thin not plicate, 4–6 in. long, narrowed to a long point, and downwards to a rather rounded base, green and glabrous above, thinly grey-silky beneath. *Racemes* oblong, dense, 1–2 in. long, sessile, often fascicled; bracts lanceolate, ⅛–¼ in. long, silky on the back, like the calyx, deciduous, not at all rigid; pedicels very short. *Calyx* ¼–⅜ in., densely clothed with adpressed shining pale brown silky hairs; teeth linear-lanceolate, the lowest exceeding the others. *Corolla* scarcely exserted; keel obtuse. *Pod* oblong, ⅝ in. long, obscurely downy, 2-seeded.

VAR. 1. *semialata*; general habit and leaflets of the type, but the petiole narrowly winged, the racemes often rather laxer and calyx-teeth narrower. F. semialata, *Roxb. Fl. Ind.* iii. 340; *Don Prodr.* 242; *W. & A. Prodr.* 241; *Wight Ic.* t. 326; *Wall. Cat.* 5746, *in greater part.* F. stricta, *Wall. Cat.* 5745 E. F. prostrata, *Roxb. Fl. Ind.* iii. 338 (a low trailing form).—Range of the type, ascending to 5000 ft. in the Central Himalayas.

VAR. 2. *latifolia*; tall, very robust, leaflets larger acute 6–9 in. long, bracts ⅜–½ in. long like the calyx densely clothed with shining adpressed brown silky hairs. F. latifolia, *Benth. Pl. Jungh.* 246; *Miq. Fl. Ind. Bat.* i. 163.—Khasia, 2–3000 ft. *Hook. fil. and Thomson, Griffith.*—DISTRIB. Java.

VAR. 3. *Wightiana*; erect, branches densely silky, leaflets smaller thicker densely clothed with adpressed grey or ferruginous silky hairs below with the veinlets raised, petiole not winged, pubescence of calyx and raceme-rachis denser and less adpressed. F. Wightiana, *Grah. in Wall. Cat.* 5751; *W. & A. Prodr.* 242. F. ferruginea, *Wall. Cat.* 5750.—Nilghiris, *Wight.* Bhotan, *Griffith.* Ava, at Taong-Dong, *Wallich.*

VAR. 4. *nana*; a low diffuse undershrub, leaflets obtuse 1–2 in. long plicate reticulato-rugose beneath, heads few subglobose few-flowered sometimes shortly peduncled, calyx-teeth deep very narrow, pod slightly downy. F. nana, *Roxb. Hort. Beng.* 56; *Fl. Ind.* iii. 339; *Wall Cat.* 5748 A; *Wight Ic.* t. 389 (suberect). F. procumbens, *Roxb. Fl. Ind.* iii. 338; *Wight Ic.* t. 408 (trailing diffuse); *Dalz. & Gibs. Bomb. Fl.* 75. F. capitata, *Ham. in Wall. Cat.* 5749.—Central and Eastern Himalayas, 2–5000 ft., Concan.

8. **F. Wallichii,** *W. & A. Prodr.* 242; branches subterete, leaflets obovate obtuse or subacute finely downy beneath, bracts small not at all rigid, calyx shaggy. F. semialata, var. vestita. *Wall. Cat.* 5746, G. F. nana, *Wall. Cat.* 5748, B. F. sericans, *Kurz in Journ. Asiat. Soc. Beng.* xliii. 2, 186.

Hills of WESTERN PENINSULA. PROME, *Wallich.* MARTABAN, *Kurz.*

Branches slender, erect, densely clothed with short spreading hairs. *Stipules* small, caducous; petiole 1–2 in., faintly winged; leaflets obovate-oblong, 2–4 in. long, glabrous on the upper surface, nearly flat. *Heads* dense, oblong, sessile, 1–2 in. long, solitary or fascicled. *Calyx* ⅜–½ in., shaggy, with dense persistent firm spreading grey hairs, slit down nearly to the base into subequal linear plumose teeth. *Corolla* included. *Pod* oblong, as long as the calyx, finely downy. Not clearly distinct from the last, from which it mainly differs in vestiture.

SUBGEN. 4. **Lepidocoma,** *Jungh.* An erect shrub. *Leaves* digitately 3-foliolate. *Flowers* in dense globose heads surrounded by large bracts (like the capitula of Compositæ).

9. **F. involucrata,** *Benth. Pl. Jungh.* 246. F. capitata, *Zolling.*; *Miq. Flor. Ind. Bat.* i. 166. Lespedeza involucrata, *Wall. Cat.* 5742. Lepidocoma trifoliatum, *Jungh. Reise,* 338.

Eastern Himalayas, ASSAM and SIKKIM, ascending to 3000 ft. PEGU, *McClelland, Kurz.* CONCAN, *Stocks.*—DISTRIB. Java.

An erect shrub, 2–4 ft. high, with slender terete zigzag woody finely downy branches. *Stipules* large, scariose, caducous; petiole ¼–½ in.; leaflets oblong or lanceolate, narrowed to both ends, 2–3 in. long, subcoriaceous, glabrous above, grey and finely downy below. *Heads* copious, both terminal on the branches and axillary on short peduncles, an inch broad, encircled by about a dozen lanceolate acuminate scariose persistent bracts ½ in. long. *Calyx* ½–⅝ in. long, shaggy with long dense grey hairs; teeth very long, the two upper subconnate. *Corolla* included; keel obtuse. *Pod* small, oblong, included, firm, downy, 1-seeded.

SUBGEN. 5. **Rhynchosioides.** Trailing herbs with herbaceous roots. *Leaves* digitately 3-foliolate; bracts minute, caducous.

10. **F. vestita,** *Benth. MSS.*; leaflets obovate-cuneate minutely pilose, stipules large persistent, flowers 4–10 in dense long-peduncled heads, corolla much exserted. Dolichos vestitus, *Grah. in Wall. Cat.* 5545.

Himalayas; from SIMLA, GARWHAL and KUMAON to KHASIA, ascending to 7000 ft. Sometimes cultivated for the sake of its tuberous esculent root.

Stems trailing to a length of 1–2 ft., branched, densely clothed with short grey hairs. *Stipules* ¼–⅜ in., lanceolate, scariose; petiole ½–1 in.; leaflets brought close to one another by their edges, not at all coriaceous, full green above, pale green beneath, minutely hairy on both sides, exstipellate, obtuse or shortly cuspidate, ½–1 in. each way. *Flowers* 3–6 together, in dense heads like *Lotus*, on pilose peduncles overtopping the leaves; pedicels very short; bracts ⅛ in., silky, oblong or roundish, cuspidate. *Calyx* ¼–⅜ in., densely brown-velvety; teeth subequal, exceeding the tube. *Corolla* bright red, half as long again as the calyx; keel much incurved, distinctly rostrate. *Pod* oblong, included, subcylindrical, 1-seeded, finely hairy.

VAR. *nilgheriensis*; leaflets smaller firmer more acute, hairs of stem and petioles longer and denser, flowers a dozen or more in a head, calyx-teeth linear, corolla scarcely exserted. F. procumbens, *Wight Ic.* t. 987; *Dalz. & Gibs. Bomb. Fl.* 75, *non Roxb.*—Hills of Western Peninsula.

11. **F. tuberosa,** *Dalz. in Kew Journ. Bot.* ii. 34; leaflets lanceolate glabrous, stipules minute caducous, flowers very lax in few-flowered peduncled dichotomous corymbs, corolla not exserted. *Dalz. & Gibs. Bomb. Fl.* 75.

CONCAN, *Dalzell, Stocks.*

Stems 2–3 ft. long, copiously branched, thinly clothed with fine spreading hairs. *Leaflets* rigidly subcoriaceous, acute, 1–2 in. long, those of the lowest leaves shorter, oblong. *Corymbs* copious, terminal and axillary, distinctly peduncled, exceeding the leaves, the last branches erecto-patent, 1–2 in. long, the flowers usually solitary, rarely geminate at their tips; bracts and bracteoles minute, rigid, ovate, like those of *Shuteria*. *Calyx* ¼ in., strongly ribbed, densely pilose; teeth lanceolate, exceeding the tube. *Blade* of standard round; keel very narrow, abruptly incurved at the tip. *Pod* oblong, 1–2-seeded, if the latter slightly exceeding the calyx.

86. DALBERGIA, Linn. fil.

Trees or climbing shrubs. *Leaves* with alternate subcoriaceous leaflets. *Flowers* copious, small, in terminal or lateral panicles. *Calyx* campanulate; teeth 5, distinct, usually short. *Corolla* exserted; standard broad; keel obtuse, with its petals only joined at the tip. *Stamens* 9–10, monadelphous or the sheath slit down the keel; anthers minute, basifixed, with the cells back to back, and the slit mostly short and apical. *Ovary* stalked, few-ovuled; style short, incurved, glabrous, stigma capitate. *Pod* oblong or strap-shaped, usually thin and flat, 1–4-seeded, indehiscent, not thickened or winged at the sutures.—DISTRIB. Species 60–70, cosmopolitan in the tropics.

SUBGEN. 1. **Sissoa,** *Benth.* *Stamens* usually nine in one bundle, the sheath of filaments being slit only along the top. *Pod* straight, thin, 1–4-seeded.

* *Leaflets large.*

1. **D. Sissoo,** *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 223; erect, leaflets 3–5 roundish with a very distinct cusp, flowers in short axillary panicles with racemoso-corymbose branches, pedicels short, pod 1–4-seeded not veined opposite the seeds. *DC. Prodr.* ii. 416; *W. & A. Prodr.* 264; *Wall. Cat.* 5850; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 40; *Bedd. Fl. Sylv.* t. 25. D. pendula, *Tenore Cat. Hort. Neap.* 84.

Plains through INDIA PROPER, ascending to 5000 ft. in the Central Himalayas.—DISTRIB. Afghanistan, Beloochistan.

An erect tree, with finely grey-downy branches. *Leaf*-rachis zigzag; leaflets firm, soon glabrescent, 1–3 in. long. *Panicles* much shorter than the leaves, the erecto-patent branches densely pubescent. *Calyx* $\frac{1}{6}$ in. deep, downy; teeth very short, the lowest rather the longest, lanceolate. *Corolla* yellowish, twice the length of the calyx; standard with a long claw and round limb. *Stamens* 9. *Pod* thin, strap-shaped, pale brown, glabrous, $1\frac{1}{2}$–4 in. by $\frac{1}{4}$–$\frac{1}{2}$ in., obtuse with a stalk twice as long as the calyx.

2. **D. latifolia,** *Roxb. Cor. Pl.* ii. 7, t. 113; erect, leaflets 5–7 orbicular obtuse, flowers in lax axillary panicles with subcorymbose branches, pedicels elongated, pod 1–3-seeded not veined opposite the seeds. *Roxb. Fl. Ind.* iii. 221; *DC. Prodr.* ii. 416; *W. & A. Prodr.* 264; *Wight Ic.* t. 1156; *Wall. Cat.* 5852; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 38; *Dalz. & Gibs. Bomb. Fl.* 77; *Bedd. Fl. Sylv.* t. 24. D. emarginata, *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 224; *Wall. Cat.* 5858.

Common through the WESTERN PENINSULA, SIKKIM and BEHAR, *Hook. fil.* BUNDELCUND, *Edgeworth.*

An erect tree, glabrous in all its parts. *Leaves* 4–6 in. long; rachis straight; leaflets $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, firm, greenish or glaucous below, often emarginate at the point, cuneate at the base, the petiolules unusually long. *Flowers* in lax broad panicles, shorter than the leaves; pedicels as long as the calyx. *Calyx* $\frac{1}{8}$–$\frac{1}{6}$ in.; teeth obtuse, rather shorter than the tube. *Stamens* 9. *Corolla* white, twice the length of the calyx. *Pod* firm, brown, strap-shaped, rather shining, $1\frac{1}{2}$–3 in. by $\frac{1}{2}$–$\frac{3}{4}$ in., in the place of the seeds distinctly marked but not wrinkled.

VAR. *sissoides*; leaflets rather narrower in proportion to their length and sometimes obtusely pointed. D. sissoides, *Grah. in Wall. Cat.* 5876; *W. & A. Prodr.* 265; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 39. D. javanica, *Miq. Flor. Ind. Bat.* i. 132? —Nilghiris. *Distrib.* Java?

3. **D. ovata,** *Grah. in Wall. Cat.* 5854; scandent, leaflets 5–7 oblong acute, flowers in axillary panicles with crowded corymbose branchlets, pedicels very short, pod 1–3-seeded not veined opposite the seeds. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 40. D. glauca, *Wall. Cat.* 5862.

MARTABAN, *Wallich.* PEGU, *Kurz.*

Whole plant glabrous, except the branchlets of the panicle. *Leaf*-rachis 2–3 in. long; leaflets firm, greenish or slightly glaucous below, the upper oblong, 3–4 in. long, narrowed gradually to a point, the lower shorter round-ovate. *Panicle* broad, about as long as the leaves, made up of distant congested clusters, the main branches spreading or even deflexed. *Flower* and *pod* just like those of *D. latifolia.*

VAR. *obtusifolia*; leaflets oblong or obovate-oblong obtuse emarginate 3–5 in. long.—Birma, *Griffith, Kurz.*

4. **D. Championi,** *Thwaites Enum. Pl. Zeyl.* 95; scandent, leaflets 1–5

oblong acute, flowers in lax axillary panicles with subcorymbose branches, pedicels as long as the calyx, pod not veined opposite the solitary seed. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 39. D. pseudo-sissoo, *Miq. Fl. Ind. Bat.* i. 128?

CEYLON, *Gardner*, *Walker*, &c.—DISTRIB. Malay isles.

Branches glabrous, twining. *Leaflets* firm, glabrous, green on both surfaces, oblong, 2–4 in. long, rounded at the base, narrowed suddenly to a point. *Panicles* as long as or shorter than the leaves, the branches finely grey-downy. *Calyx* $\frac{1}{8}$ in., subglabrous; teeth short, obtuse. *Corolla* twice the length of the calyx; claws of the petals as long as the calyx. *Stamens* 9. *Pod* strap-shaped, obtuse, 3–4 in. by $\frac{3}{4}$–$\frac{7}{8}$ in., always 1-seeded.

5. **D. rimosa,** *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 233; erect, leaflets 5–9 oblong obtuse or acute, flowers very small in axillary and terminal panicles with corymbose branches, pedicels very short, pod thickened and veined opposite the solitary seed. *Wall. Cat.* 5853; *Wight Ic.* t. 262; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 32.

Eastern Himalayas, tropical zone, ascending to 4000 ft.; KHASIA, SILHET, ASSAM.

Leaf-rachis straight, 2–4 in. long; leaflets moderately firm, oblong or obovate-oblong, 2–4 in. long, bright green above, grey with a thin coating of grey short adpressed hairs beneath. *Panicles* broad and corymbose, with finely grey-downy branches, the very numerous small flowers in crowded corymbs. *Calyx* $\frac{1}{24}$ in., finely downy; teeth obtuse, subequal, about as long as the tube. *Corolla* white, twice as long as the calyx; claws of the petals very short. *Pod* oblong, glabrous, 2–3 in. by 1–1$\frac{1}{4}$ in., much thickened opposite the large seed. *Seeds* very rarely 2.

6. **D. foliacea,** *Wall. Cat.* 5856 A, C, D; erect, leaflets 9–13 elongate-oblong obtuse or acute, flowers small mostly in ample terminal panicles with corymbose branches, pedicels short, pod thickened and veined opposite the usually solitary seed. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 41.

Forests of AVA, PEGU, and MARTABAN.

Leaf-rachis straight, 3–4 in. long; leaflets rigidly subcoriaceous, glabrous, not glaucous beneath. *Panicle* $\frac{1}{2}$–$\frac{3}{4}$ ft., the main branches wide-spreading, rather decurved, the branchlets clothed with thin grey-brown pubescence. *Calyx* $\frac{1}{12}$ in., finely downy, the lowest tooth about as long as the tube. *Corolla* twice the length of the calyx, the claws of the petals short. *Pod* just like that of *D. rimosa*.

** *Leaflets few, small.*

7. **D. rubiginosa,** *Roxb. Cor. Pl.* ii. 9, t. 115; *Fl. Ind.* iii. 231; scandent, leaflets 5–7 oblong obtuse glabrous beneath, flowers in short crowded axillary panicles, pedicels very short, petal-claws as long as the calyx, ovaries 3–4-ovuled. *DC. Prodr.* ii. 416; *W. & A. Prodr.* 265; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 43.

WESTERN PENINSULA.—DISTRIB. South China.

Habit of *D. monosperma*, from which it may be readily known by the stamens and ovary. *Branches* glabrous, twining. *Leaflets* firm, not conspicuously veined, 1–2 in. long, rather glaucous beneath. *Panicles* 1–2 in. long, sessile, the branchlets finely pubescent. *Calyx* scarcely $\frac{1}{8}$ in. long, finely brown-silky, with a pair of small obtuse persistent bracteoles; teeth short, obtuse. *Corolla* twice the length of the calyx. *Pod* unknown.

8. **D. congesta,** *Grah. in Wall. Cat.* 5872; scandent, leaflets 7–11 oblong obtuse more or less clothed with brown pubescence beneath, flowers in short crowded axillary panicles, pedicels very short, petal-claws as long as the calyx, pod 1–2-seeded not veined opposite the seeds. *W. & A. Prodr.* 265; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 43. D. Gardneriana, *Benth. loc. cit.*

NILGHIRIS, *Noton, Gardner,* &c.

Closely allied to *D. rubiginosa,* of which it is perhaps a variety. *Branchlets* and leaves below at first densely clothed with brown pubescence. *Leaflets* very thick, 1–1¼ in. long, emarginate. *Panicles* 1–2 in. long, dense, the branches densely brown-velvety. *Pedicels* $\frac{1}{24}$–$\frac{1}{12}$ in. *Calyx* $\frac{1}{8}$ in., with a pair of conspicuous adpressed bracteoles; teeth short. *Corolla* twice the length of the calyx. *Pod* thin, brown, glabrous, distinctly stalked, strap-shaped, 1½–2½ in. by ½ in.

9. **D. cultrata,** *Grah. in Wall. Cat.* 5861; erect, leaflets 7–11 obovate-oblong obtuse emarginate glabrous, flowers in short axillary fascicled panicles with racemose branches, pedicels as long as the calyx, petal-claws short, pod 1-3-seeded not veined opposite the seeds. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 39.

PROME HILLS, *Wallich.* PEGU, *McClelland.*

General habit like that of *D. lanceolaria. Branches* and leaves below glabrous. *Leaflets* 1½–2 in. long, moderately firm, green on both sides. *Flowers* in copious rather lax panicles, with slender ascending subglabrous branches. *Calyx* $\frac{1}{12}$ in., subglabrous; teeth short. *Corolla* twice the calyx. *Pod* just like that of *D. lanceolaria,* from which it can only be distinguished by the flowers.

*** *Leaflets many, small.*

10. **D. Junghuhnii,** *Benth. Pl. Jungh.* i. 254; scandent, leaflets 9–15 oblong glabrous obtuse, flowers minute mostly in ample terminal panicles with crowded cymose branches, pedicels and petal-claws very short, pod oblong not veined opposite the solitary seed. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 33. D. parviflora, *Roxb. Fl. Ind.* iii. 225?

MALACCA, *Griffith, Maingay.*—DISTRIB. Malay isles.

Branches slender, glabrous, often twisted. *Leaves* 2–3 in. long; leaflets thick, rigid, ½–1½ in. long, truncate or emarginate, glabrous, slightly glaucous below. *Branches* of the panicle downy, the ultimate branchlets forming distinct scorpioid cymes. *Calyx* glabrous, under $\frac{1}{12}$ in.; teeth short, obtuse, the lowest the longest. *Corolla* $\frac{1}{8}$ in. *Pod* thin, membranous, greenish, glabrous, distinctly stalked, 2½–3 in. by 1–1¼ in.

11. **D. confertiflora,** *Benth. Pl. Jungh.* i. 255; scandent, leaflets 11–15 oblong glabrous obtuse, flowers mostly in ample terminal panicles with crowded corymbose branches, pedicels and petal-claws short, pod 1–2-seeded strap-shaped rather veined opposite the seeds. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 41. D. paniculata, *Wall. Cat.* 5848, E & I, *ex parte.*

OUDH and SILLET, *Wallich.* CONCAN, *Stocks.*

Habit of *D. volubilis,* from which it can only be safely distinguished by the stamens. *Leaves* 4–6 in. long; leaflets moderately firm, 1–2 in. long, obtuse or emarginate, much paler below than above, but scarcely glaucous. *Branches* of the panicle densely pubescent. *Calyx* $\frac{1}{8}$ in.; upper teeth short, obtuse, lowest lanceolate. *Corolla* not more than half as long again as the calyx. *Pod* thin, glabrous, brownish, 2–3 in. by $\frac{5}{8}$–$\frac{3}{4}$ in., narrowed to the point and to a stalk nearly half an inch long.

12. **D. velutina,** *Benth. Pl. Jungh.* 255; scandent, leaflets 13–17 oblong obtuse ferrugineo-pubescent, flowers in peduncled axillary panicles with corymbose branches, pedicels short, petal-claws long, pod 1–3-seeded strap-shaped not veined opposite the seeds. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 43. D. stipulata, *Wall. Cat.* 5868 A, B *ex parte.*

KHASIA, SILHET, and EASTERN PENINSULA.

Branches, pedicels, and leaves, especially on the underside, at first densely clothed with dark brown tomentum. *Leaves* 6–9 in. long; leaflets moderately firm, not

veined, rather glaucous beneath, 1½–2 in. long; stipules large, lanceolate, velvety, more persistent than in the other species. *Panicle* distinctly peduncled, ½–⅓ as long as the leaves, the branches densely brown-pubescent, spreading or ascending; pedicels shorter than the calyx, furnished with small subpersistent bracts and bracteoles. *Calyx* ⅛ in.; upper teeth very short; lowest lanceolate, rather longer. *Corolla* twice the calyx. *Pod* thin, obtuse, brownish, short-stalked, 2–3½ in. by ⅝–¾ in.

13. **D. Stocksii,** *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 42; scandent, leaflets 11–15 oblong obtuse with a few obscure adpressed hairs, flowers in copious axillary panicles with corymbose branches, pedicels and petal-claws short, pod thin oblong veined opposite the large usually solitary seed.

CONCAN, *Stocks.*

Branches finely grey-downy. *Leaves* 4–5 in. long; leaflets thin for the genus, ¾–1 in. long, emarginate, with only a few obscure short adpressed hairs below when mature. *Panicles* copious, distinctly peduncled, nearly or quite as long as the leaves; branches slender, densely finely grey-downy, densely corymbose at the tip, the lower ones distant. *Calyx* oblique, $\frac{1}{12}$ in., densely grey-downy; teeth half as long as the tube. *Corolla* twice the length of the calyx. *Pod* quite characteristic, thin, glabrous, ¾–1½ in. by ½ in., the usually solitary seed filling up the greater part, subacute, cuneate at the base with a very long stalk.

14. **D. sympathetica,** *Nimmo in Grah. Cat. Bomb. Pl.* 55; scandent, leaflets 11–15 oblong obtuse thinly grey-silky, flowers in dense short axillary panicles with dense corymbose branches, pedicels and petal-claws short, pod thin greenish oblong 1–2-seeded not veined opposite the seeds. *Benth. Pl. Jungh.* 255; *Journ. Linn. Soc.* iv., *Suppl.* 42; *Dalz. & Gibs. Bomb. Fl.* 78. D. frondosa, *Wall. Cat.* 5855 B; *W. & A. Prodr.* 266, *ex parte* (*Wt. Herb.* 918). D. ferruginea, *Hohen. Pl. Can. Exsic.* No. 343, *non Roxb.*

Hills of the WESTERN PENINSULA.

Trunk armed with strong large curved thorns, the branches often twisted, the young ones finely grey-downy. *Leaves* 4–6 in. long; leaflets moderately firm, obtuse or emarginate, ½–1 in. long, thinly silky at first, especially beneath. *Panicles* distinctly peduncled, with finely downy ascending curved branches, the ultimate branchlets secund. *Calyx* $\frac{1}{12}$ in., silky, with a pair of small obtuse adpressed bracteoles; teeth short, obtuse. *Corolla* twice the length of the calyx. *Pod* membranous, obtuse, 2–3 in. by ¾–1 in., with an unusually short stalk.—Closely resembles *D. volubilis* in leaves and general habit.

15. **D. tamarindifolia,** *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 233; scandent, leaflets 25-41 thinly pubescent crowded trapezoid-oblong, flowers in congested sessile axillary panicles with corymbose branches, pedicels short, petal-claws as long as the calyx, pod thin 1–3-seeded strap-shaped not veined opposite the seeds. *Wight. Ic.* t. 242; *Wall. Cat.* 5870; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 44. D. livida, *Wall. Cat.* 5866 A, *ex parte*, B. D. rufa, and D. multijuga, *Grah. in Wall. Cat.* 5864, 5865. D. Blumei, *Hassk. Pl. Jav. Rar.* 400. Derris pinnata, *Lour. Fl. Cochin.* 432.

Eastern Himalayas; NIPAL, SIKKIM, SILHET, KHASIA, ascending to 4000 ft., and frequent down the gulf to MALACCA. Hills of WESTERN PENINSULA.—DISTRIB. Malay isles.

Branches densely clothed with fine brown pubescence. *Leaves* ¼–½ foot; leaflets quite different in shape to that of all the other species, nearly sessile, caducous, moderately firm, ½–1 in. long, glaucous, thinly clothed with brown pubescence beneath, especially on the midrib. *Panicles* sessile, 1–2 in. long, the branches densely brown-pubescent; pedicels shorter than the calyx; bracts and bracteoles minute, downy, persistent. *Calyx* ⅛ in., downy; teeth short, obtuse. *Corolla* white, 2–3 times the length of the calyx; blade of the standard orbicular. *Stamens* 10. *Pod* thin, bright brown, glabrous, long-stalked, 1½–3 in. by ½–¾ in.

VAR. 1. *pubescens*; branches and leaves below clothed with persistent dense thick pubescence.—Concan, *Stocks.*

VAR. 2. *acaciæfolia*; leaflets thicker very oblique rigidly coriaceous glabrous bright green above glaucous beneath. D. acaciæfolia, *Dalz. in Kew Journ.* ii. 37.—Concan.

SUBGEN. 2. **Dalbergaria,** *Benth.* Sheath of filaments slit both along the top and bottom, so that the *stamens* are in two bundles containing five each. *Pod* straight, thin, 1–3-seeded.

16. **D. lanceolaria,** *Linn.*; *DC. Prodr.* ii. 417; erect, leaflets 11–15 glabrous obtuse, flowers in copious ample terminal and axillary panicles with corymbose branches, pedicels bracteate as long as the calyx, calyx-teeth nearly as long as the tube, pod glabrous usually 1-seeded rather thickened and veined opposite the seed. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 45; *Dalz. & Gibs. Bomb. Fl.* 78. D. frondosa, *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 226; *DC. Prodr.* ii. 417; *W. & A. Prodr.* 266, *in part*; *Wight Ic.* t. 266; *Wall. Cat.* 5855, A, C, D; *Bedd. Fl. Sylv.* 88. D. zeylanica, *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 228; *Wall. Cat.* 5847. D. arborea, *Heyne*; *DC. Prodr.* ii. 417. D. robusta, *Wall. Cat.* 5849 A. D. hircina, *Wall. Cat.* 5871 A, *not* B.

Plains from the WESTERN HIMALAYAS to CEYLON.

An erect tree, reaching 60–80 feet in height, with glabrous branches. *Leaves* 3–6 in. long; leaflets rigidly subcoriaceous, with slightly raised veins, green above, paler and rather glaucous below, 1–2 in. long, rounded at both ends, emarginate at the apex. *Branches* of the panicle wide-spreading, silky or subglabrous. *Calyx* $\frac{1}{8}$ in., more or less silky; teeth obtuse, the lowest rather longer. *Corolla* 2–3 times as long as the calyx, the standard $\frac{1}{4}$ in. broad, with a large callosity at the base of the limb, the keel much shorter than the wings. *Pod* $1\frac{1}{2}$–4 in. by $\frac{5}{8}$–$\frac{3}{4}$ in., bright brown, flexible, narrowed to the point and gradually at the base into a long stalk.

17. **D. purpurea,** *Wall. Cat.* 5869; scandent, leaflets 11–13 glabrous obtuse, flowers in copious ample terminal and axillary panicles with corymbose branches, pedicels ebracteate as long as the calyx, calyx-teeth much shorter than the tube, pod glabrous 1-seeded rather thickened and veined opposite the seed. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 46.

MARTABAN, *Wallich, Griffith.* PEGU, *Kurz.*

Closely allied to *D. lanceolaria*, from which it differs by its scandent habit, smaller flowers (under $\frac{1}{4}$ in. long), and shorter calyx-teeth.

18. **D. volubilis,** *Roxb. Cor. Pl.* ii. 48, t. 191; *Fl. Ind.* iii. 231; scandent, leaflets 11–13 glabrous obtuse, flowers in copious ample terminal and axillary panicles with corymbose branches, pedicels very short ebracteate, calyx-teeth minute, pod glabrous 1–2-seeded rather thickened and veined opposite the seed. *DC. Prodr.* ii. 417; *Wall. Cat.* 5874; *W. & A. Prodr.* 265; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 46; *Dalz. & Gibs. Bomb. Fl.* 78.

CENTRAL and EASTERN HIMALAYAS, to PEGU and CEYLON.

Closely allied to the two preceding. *Branches* of the panicle densely clothed with brown velvety pubescence, the main ones horizontal or even decurved, the ultimate corymbs densely congested. *Calyx* $\frac{1}{12}$ in. long, densely velvety. *Corolla* 2–3 times the length of the calyx. *Pod* just like that of *D. lanceolaria.*

19. **D. assamica,** *Benth. Pl. Jungh.* 255; scandent, leaflets 15–21 obtuse glabrous or nearly so, flowers in axillary panicles much shorter than the leaves with corymbose branches, pedicels as long as the calyx, calyx-teeth nearly as long as the tube, pod glabrous flexible 1–2-seeded. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 45.

Tropical HIMALAYAS, from Kumaon eastwards; ASSAM, *Griffith, Jenkins.*

A twiner, with glabrous branches. *Leaves* 6–10 in. long; leaflets the same shape and size as in *D. lanceolaria*, but rather thinner, with a few hairs at the beginning on the under surface. *Panicles* deltoid, moderately close, 3–4 in. long, with slender fine silky branches. *Calyx* $\frac{1}{12}$ in., finely silky, the lowest tooth lanceolate, as long as the tube, the others obtuse, rather shorter. *Corolla* under $\frac{1}{4}$ in. *Pod* just like that of *D. lanceolaria.*

20. **D. paniculata,** *Roxb. Cor. Pl.* ii. 8, t. 114; *Fl. Ind.* iii. 227; erect, leaflets 9–15 obtuse glabrous or nearly so, flowers in copious axillary and terminal panicles with racemoso-corymbose branchlets, pedicels very short, calyx-teeth as long as the tube, pod glabrous 1–3-seeded rather thickened and veined opposite the seeds. *DC. Prodr.* ii. 417; *W. & A. Prodr.* 265; *Wall. Cat.* 5848, A to D; *Dalz. & Gibs. Bomb. Fl.* 78; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 45; *Bedd. Fl. Sylv.* 88.

Plains of the WESTERN PENINSULA.

A tall erect tree, the ultimate branches clothed with short erect grey-brown silky pubescence. *Leaflets* like those of *D. lanceolaria* in shape, size and texture. *Panicle* very different, mainly terminal, but much less ample, the branches always densely dotted with brown silky pubescence, the main ones erecto-patent. *Calyx* $\frac{1}{8}$ in., subsessile, densely silky. *Corolla* twice the length of the calyx, the limb of the standard not more than $\frac{1}{8}$ in. broad, without any callosity at the base, the keel much shorter than the other petals. *Pod* just like that of *D. lanceolaria.*

21. **D. glomeriflora,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 70; erect, leaflets 7–9 acute slightly pubescent beneath, flowers in congested panicles, pedicels nearly obsolete, calyx-teeth obtuse, pod unknown.

BIRMA, at Prome, *Kurz.*

A middle-sized erect tree, with fulvo-tomentose branchlets. *Leaflets* ovate-oblong or obovate. 2–2½ in. long, thinly coriaceous, glabrous above. *Panicle* subcapitate, with villose branches. *Calyx* glabrous, $\frac{1}{8}$ in. *Corolla* white, a little longer than the calyx.—*Ex Kurz loc. cit.*

22. **D. hircina,** *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 46; erect, leaflets 17–25 obtuse both surfaces clothed with short persistent grey hairs, flowers in short congested axillary corymbose panicles, pedicels ebracteate as long as the calyx, calyx-teeth nearly as long as the tube, pod small glabrous 1–3-seeded slightly thickened but not veined opposite the seeds. *Wall. Cat.* 5871 B, *not* A.

Central and Eastern Himalayas, tropical zone; from GARWHAL and KUMAON to BHOTAN, ascending to 4000 ft.

Leaf-rachis 6–10 in. long, finely grey-downy; leaflets obtuse at both ends, firm. with veins rather raised, emarginate at the apex, 1–1½ in. long. *Panicles* short-peduncled, 1–2 in. long, with densely pubescent ascending branches. *Calyx* $\frac{1}{12}$ in. long, densely pubescent. *Corolla* scarcely more than twice the length of the calyx; standard obovate, $\frac{1}{8}$ in. broad; keel distinctly shorter than the wings. *Pod* much smaller than that of its allies, often 3–4-seeded, 1–1½ in. by $\frac{1}{4}$ in., obtuse or subacute, narrowed gradually into a stalk twice as long as the calyx.

23. **D. Thomsoni,** *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 33; scandent, leaflets 9–11 glabrous obtuse, flowers in copious ample terminal and axillary panicles, ultimate branches secund cymose, pedicels very short minutely bracteate, calyx-teeth minute, pod thin greenish rather oblique slightly thickened and veined opposite the solitary seed.

UPPER ASSAM, *Griffith.* KASIA, 2–4000 ft., *Hook. fil. & Thomson.*

A climber, with even the branches of inflorescence nearly glabrous. *Leaflets* very firm in texture, greenish on both surfaces, $\frac{3}{4}$–1 in. long, obtuse, slightly emarginate. *Inflorescence* mainly terminal, the principal branches erecto-patent, the ultimate ones forming distinct elongated scorpioid cymes. *Flowers* much smaller than in any of its neighbours and very deciduous, the minute pedicels subtended by lanceolate bracts as long as themselves. *Calyx* $\frac{1}{24}$ in., subglabrous. *Corolla* under $\frac{1}{8}$ in. long. *Pod* 2–2$\frac{1}{2}$ in. by $\frac{3}{4}$ in., thin and not turning brown, narrowed from the middle to a very short stalk, the lower suture much more rounded than the upper one.

24. **D. cana,** *Grah. in Wall. Cat.* 5859; scandent, leaflets 15–19 acute glabrescent, flowers in short axillary panicles with corymbose branchlets, pedicels ebracteate as long as the calyx, calyx-teeth shorter than the tube, pod thin flat one-seeded softly pubescent not at all thickened or veined opposite the seed. *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 70.

MOULMEIN, *Wallich.* PEGU and MARTABAN, *Kurz.*

Branches, leaf-rachises and leaves below thinly clothed with deciduous brown silky hairs. *Leaves* $\frac{1}{2}$–1 ft. long; leaflets rigidly subcoriaceous, 1$\frac{1}{2}$–2$\frac{1}{2}$ in. long, rounded at the base, narrowed to a point, the veinlets rather raised on the undersurface. *Panicles* sparse, much shorter than the leaves, the erecto-patent branches finely brown-silky. *Calyx* subglabrous, $\frac{1}{8}$–$\frac{1}{6}$ in.; teeth lanceolate-deltoid. *Corolla* twice the length of the calyx. *Pod* strap-shaped, straight, 2–2$\frac{1}{2}$ in. by $\frac{1}{2}$–$\frac{5}{8}$ in., pale dull brown, narrowed suddenly at the base to a stalk twice as long as the calyx.

25. **D. stipulacea,** *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 233; scandent, leaflets 17–25 obtuse glabrous or nearly so, flowers in copious axillary panicles with elongated racemose branches, pedicels longer than the calyx with conspicuous persistent bracts and bracteoles, calyx-teeth as long as the tube, pod firm glabrous one-seeded thickened and veined opposite the seed. *Wight Ic.* t. 453; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 47. D. ferruginea. *Roxb. Fl. Ind.* iii. 228. D. tingens, *Wall. Cat.* 5860. D. cassioides, *Wall. Cat.* 5863. D. livida, *Wall. Cat.* 5866 A, *in part.* D. rostrata, *Grah. in Wall. Cat.* 5867.

Eastern Himalayas, tropical zone, ascending to 4000 ft. in SIKKIM; ASSAM, KHASIA, SILHET, CHITTAGONG, PEGU, MARTABAN, TENASSERIM.—DISTRIB. Malay isles.

Branches glabrous, or at first finely grey-downy. *Leaf-rachis* 4–6 in. long: leaflets moderately firm, obtuse, 1–1$\frac{1}{2}$ in. long, glabrous, or at first minutely hairy beneath, green above, subglaucous beneath. *Panicles* much shorter than the leaves, with only a few lax ascending branches, the inflorescence readily distinguishable from that of all the others by the conspicuous persistent oblanceolate glabrous bracts and bracteoles. *Calyx* subglabrous, $\frac{1}{6}$ in. long; lowest tooth linear, exceeding the others. *Corolla* purplish, twice the length of the calyx; blade of the standard roundish. *Pod* the largest and thickest of the group, 2–4 in. by 1 in., strap-shaped, obtuse, narrowed suddenly into a stalk twice as long as the calyx.

SUBGEN. 3. **Selenolobium,** *Benth.* *Stamens* in two bundles of 5 each. *Pod* obliquely orbicular-oblong, rather recurved, usually 1-seeded.

26. **D. monosperma,** *Dalz. in Kew Journ. Bot.* ii. 36; scandent, spineless, leaflets 5–7 obtuse moderately small, pod flat. *Dalz. & Gibs. Bomb. Fl.* 78; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 48. D. torta, *Grah. in Wall. Cat.* 5879. D. paniculata, *Wall. Cat.* 5848 I, *ex parte.*

Shores of the WESTERN PENINSULA, CEYLON and MALAYAN PENINSULA.—DISTRIB. Malay isles, China, Philippines, N. Australia.

A wide-twining shrub, with lithe much-twisted black glabrous branches. *Leaflets* usually 5, obovate-oblong, glabrous, obtuse, often emarginate, 1–1$\frac{1}{2}$ in. long. *Flowers* in sessile congested axillary panicles, 1–2 in. long, the branches only inconspicuously downy; pedicels shorter than the calyx. *Calyx* $\frac{1}{8}$ in., subglabrous, with a pair of

minute obtuse bracteoles; teeth short, obtuse. *Corolla* $\frac{1}{4}$ in.; claws as long as the calyx; standard narrow. *Pod* brown, flat, glabrous, under 1 in. long, the upper suture recurved; stalk as long as the calyx.

27. **D. spinosa,** *Roxb. Fl. Ind.* iii. 233; erect, branchlets spine-tipped, leaflets 7–9 small obtuse, pod flat. *W. & A. Prodr.* 266; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 49. D. horrida, *Grah. in Wall. Cat.* 5877.

Shores of the EASTERN and WESTERN PENINSULAS. CHITTAGONG, *Roxburgh*.

A stiff erect shrub, with numerous short round horizontal branchlets, ending in pungent spines. *Leaves* crowded, from the nodes of the branchlets, 1–1½ in. long; leaflets firm, obovate-oblong, $\frac{1}{4}$–$\frac{1}{2}$ in. long. *Flowers* in congested sessile corymbose panicles, with minutely downy branches; pedicels shorter than the calyx. *Calyx* $\frac{1}{12}$ in., minutely downy; teeth short, obtuse. *Corolla* whitish, twice the length of the calyx. *Pod* 1 in. long, brown, glabrous, reniform.

28. **D. reniformis,** *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 226; erect, spineless, leaflets 9–11 large acute nearly or quite glabrous, pod turgid. *Wight Ic.* t. 261. D. flexuosa, *Grah. in Wall. Cat.* 5875. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 48. D. stipulata, *Wall. Cat.* 5868 B, *ex parte*.

SILLET, *Roxburgh, Wallich*. PEGU, *Kurz*. TENASSERIM, *Griffith*.

A large crooked bushy tree, with fine brown-silky branchlets. *Leaves* 4–8 in. long; leaflets rigidly coriaceous, glabrescent, 1½–2 in. long, broadly rounded at the base. *Flowers* in deltoid close axillary panicles, shorter than the leaves, the branchlets racemose, densely brown-velvety. *Calyx* $\frac{1}{8}$ in., campanulate, densely silky; teeth deltoid, shorter than the tube. *Corolla* twice the length of the calyx, white; standard obovate-emarginate. *Pod* glabrous, rigid, usually one-seeded, an inch broad by $\frac{1}{4}$–$\frac{1}{3}$ in., narrowed suddenly into a stalk $\frac{1}{4}$–$\frac{1}{3}$ in. long.

IMPERFECTLY KNOWN SPECIES.

29. **D. stenocarpa,** *Kurz in Journ. Asiat. Soc. Beng.* xliv. 2, 205.

Shrub, with the young parts clothed with golden or fulvous silky pubescence. *Leaves* 5–8 in. long; leaflets 9–13, oblong, 1–1⅔ in. long, retuse, with a minute mucro, chartaceous, glaucescent and thinly pilose beneath. *Panicles* axillary, much shorter than the leaves; rachises pilose; pedicels $\frac{1}{12}$ in. *Calyx* $\frac{1}{12}$ in., pilose; upper tooth very short, obtuse; lower very long, subulate. *Corolla* and stamens unknown. *Pod* linear, 1–2 in. by $\frac{1}{6}$ in., flat, brown, thin, narrowed gradually to a long stalk, indistinctly veined, 1–5 seeded. Pod of *D. Sissoo* and habit of *D. lanceolaria*. Sikkim at Pankabari, *Gamble.—Ex Kurz loc. cit.*

87. PTEROCARPUS, Linn.

Erect trees. *Leaves* with alternate coriaceous exstipellate leaflets. *Flowers* yellowish, in copious panicled racemes; bracts and bracteoles minute, caducous; pedicels distinctly articulated at the apex. *Calyx* turbinate, curved before expansion, the teeth short. *Petals* exserted, with long claws; standard and wings crisped; keel obtuse, the petals scarcely or not at all coherent. *Staminal* sheath slit both above and below, or above only; the upper stamen often nearly or quite free; anthers versatile. *Ovary* stalked, 2-ovuled; style incurved, stigma terminal. *Pod* orbicular, rarely other than 1-seeded, with a broad rigid wing, the point turned down to opposite the base or near it.—DISTRIB. Species about 15; cosmopolitan in the Tropics.

1. **P. indicus,** *Willd.*; *DC. Prodr.* ii. 419; leaflets 7–11 ovate acute, veining fine, racemes panicled, pedicels as long as the calyx, stamens 2–3-adelphous, stalk of pod exceeding the calyx, beak of pod a space above the outer base. *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 77; *Bedd. Fl. Sylv.* t. 23. P. dalbergioides, *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 236; *DC. Prodr.* ii. 418; *Wall. Cat.* 5843; *W. & A. Prodr.* 267. P. Wallichii, *W. & A. Prodr. loc. cit.*

EASTERN and WESTERN PENINSULAS.—DISTRIB. Malay isles, Philippines, China.

A tall tree, with ascending glabrous branches. *Leaves* $\frac{1}{2}$–$\frac{3}{4}$ ft. long; leaflets moderately firm, 2–4 in. long, glabrous, rounded or deltoid at the base, always narrowed to a point; petiolules $\frac{1}{4}$–$\frac{1}{3}$ in.; main veins fine, distant. *Flowers* in copious terminal and axillary panicles, with subsecund racemose branches, clothed with fine brown pubescence; pedicels $\frac{1}{4}$–$\frac{1}{3}$ in., furnished with a pair of linear spreading caducous bracteoles at the apex. *Calyx* $\frac{1}{5}$–$\frac{1}{4}$ in., finely brown-silky; teeth rounded, the two upper much the largest. *Corolla* exceeding the calyx; standard $\frac{3}{8}$–$\frac{1}{2}$ in. broad. *Pod* orbicular, 2 in. broad, silky and veined against the seed, the wing $\frac{1}{2}$–$\frac{1}{3}$ in broad, the style a considerable distance above the base, pointing outwards, at a right angle with the stalk.

2. **P. macrocarpus,** *Kurz in Journ. Asiat. Soc. Beng.* xliii. 2, 187; leaflets 7–11 ovate-oblong pointed, racemes simple, pedicels as long as the calyx, stamens diadelphous, beak of pod at the basal corner.

MARTABAN and TENASSERIM, *Kurz.*

A tree, with fulvo-pubescent branchlets. *Leaves* $\frac{1}{2}$–$\frac{2}{3}$ ft.; rachis fulvo-puberulous; leaflets coriaceous, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, at first fulvo-pubescent beneath; petiolules $\frac{1}{12}$–$\frac{1}{6}$ in. *Racemes* simple, axillary, fulvo-pubescent; pedicels $\frac{1}{4}$–$\frac{1}{3}$ in. *Calyx* $\frac{1}{4}$ in., velvety. *Corolla* slightly exceeding the calyx. *Pod* canescent, roundish, $1\frac{1}{2}$–2 in. broad; wings subplicate. *Ex Kurz loc. cit.*

3. **P. santalinus,** *Linn. fil.*; *DC. Prodr.* ii. 419; leaflets 3 ovate obtuse, veining fine, pedicels rather shorter than the calyx, stamens 2–3-adelphous, stalk of pod much exceeding the calyx, beak of pod at the basal corner. *Roxb. Fl. Ind.* iii. 234; *Wall. Cat.* 5844; *W. & A. Prodr.* 266; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 76; *Bedd. Fl. Sylv.* t. 22.

WESTERN PENINSULA.

Branches obscurely grey-downy. *Leaflets* 3 in all our specimens, but said to be sometimes 5, 2–4 in. long, rounded at both ends, slightly emarginate, clothed with obscure adpressed grey hairs below. *Racemes* shorter and less copious than in *P. indicus*, the pedicels shorter. *Calyx* $\frac{1}{5}$–$\frac{1}{4}$ in.; teeth deltoid, minute. *Limb* of standard not longer than the calyx. *Pod* silky at first, the same size as in *P. indicus*, but the centre more turgid, wing narrower and style brought down to the basal corner.

4. **P. Marsupium,** *Roxb. Cor. Pl.* ii. t. 116; *Fl. Ind.* iii. 234; leaflets 5–7 oblong usually obtuse, veins close and prominent, pedicels shorter than the calyx, stamens monadelphous, stalk of pod scarcely exceeding the calyx, beak of pod at the basal corner. *DC. Prodr.* ii. 418; *W. & A. Prodr.* 266; *Wall. Cat.* 5842; *Bedd. Fl. Sylv.* t. 21; *Dalz. & Gibs. Bomb. Fl.* 76. P. bilobus, *Roxb. MSS.*; *G. Don, Gen. Syst.* ii. 376.

Plains of the WESTERN PENINSULA and CEYLON.

Leaflets thicker than in the others, green and glabrous on both surfaces, 3–5 in. long, obtuse or subacute, sometimes slightly or deeply emarginate, often twice as long as broad, the main veins much closer, more numerous, and more prominent than in the others. *Racemes* ample, copious, lateral and terminal, the branches thinly clothed with brown pubescence; pedicels $\frac{1}{24}$–$\frac{1}{12}$ in. *Calyx* $\frac{1}{5}$–$\frac{1}{4}$ in., finely brown-downy; teeth deltoid, the two upper ones the largest. *Corolla* twice the length of the calyx; sheath of *stamens* sometimes finally split down the keel as well as the top. *Pod* 1–2 in. broad, the same shape as in the last, but the seed smaller and wing broader.

88. **PONGAMIA,** *Vent.*

Arborescent or fruticose. *Leaves* odd-pinnate. *Flowers* racemed. *Calyx* campanulate, nearly truncate. *Corolla* much exserted; standard broad; keel obtuse, the petals cohering at the tip. *Stamens* monadelphous, the upper filament free low down; anthers oblong, versatile. *Ovary* subsessile, 2-ovuled;

style incurved, glabrous, stigma capitate. *Pod* woody, flattened, oblong, inde-hiscent, not at all winged or thickened at the sutures.—DISTRIB. A single species, with the habit of *Derris* from which it differs only in the pod.

1. **P. glabra,** *Vent. Jard. Malm.* t. 28; *DC. Prodr.* ii. 416; *Wall. Cat.* 5878; *W. & A. Prodr.* 262; *Wight Ic.* t. 59; *Dalz. & Gibs. Bomb. Fl.* 77; *Bedd. Fl. Sylv.* t. 177. Galedupa indica, *Lam.*; *Roxb. Fl. Ind.* iii. 239. G. arborea, *Roxb. Hort. Beng.* 53. Robinia mitis, *Linn. Sp.* 1044. Dalbergia arborea, *Willd. Sp.* iii. 901. Legum. indet. *Wall. Cat.* 5979.—*Rheede Hort. Mal.* vi. t. 3.

CENTRAL and EAST HIMALAYAS, to CEYLON and MALACCA, especially near the coast. —DISTRIB. Malay isles, N. Australia, Polynesia, Seychelles.

A tall erect tree or climber, with glabrous branches and leaves. *Leaflets* 5–7, opposite, subcoriaceous, oblong or ovate, pointed, stalked, 2–4 in. long. *Flowers* in simple peduncled axillary racemes, nearly as long as the leaves; pedicels 2–4-nate, $\frac{1}{4}$–$\frac{1}{3}$ in., with a pair of minute bracteoles in the middle. *Corolla* $\frac{1}{2}$ in.; standard silky on the back. *Pod* woody, glabrous, $\frac{1}{8}$–$\frac{1}{4}$ in. thick, $1\frac{1}{2}$–2 in. long, with a short decurved point.

89. DERRIS, *Lour.*

Climbers, rarely erect trees. *Leaves* odd-pinnate, with exstipellate leaflets. *Flowers* copious, usually fascicled, showy, in axillary or terminal racemes or panicles. *Calyx* campanulate, nearly truncate. *Corolla* much exserted; standard broad; keel obtuse, the petals cohering slightly. *Stamens* usually monadelphous, the upper one free in § *Aganope*; anthers versatile. *Ovary* sessile, 2-∞-ovuled; style incurved, filiform, stigma capitate. *Pod* rigid, thin, flat, indehiscent, oblong if one-seeded, strap-shaped if few-seeded, with a distinct wing down the upper or both sutures.—DISTRIB. Species about 40, belting the world in the tropics, but most abundant in our area.

SECT. 1. **Brachypterum,** *W. & A.* *Pod* thin, strap-shaped, narrow ($\frac{1}{2}$ in. or less broad), winged along the upper suture. *Stamens* monadelphous. *Leaflets* comparatively small. Climbers or erect trees.

1. **D. scandens,** *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 103; scandent, leaflets 9–18 obtuse or acute equal at the base, flowers in very long racemes with distant nodes and many flowers to a fascicle with unequal pedicels. Dalbergia scandens, *Roxb. Cor. Pl.* ii. t. 192; *Fl. Ind.* iii. 232; *DC. Prodr.* ii. 417; *Wall. Cat.* 5857; *W. & A. Prodr.* 264; *Wight Ic.* t. 275. D. timoriensis, *DC. Prodr.* ii. 417. Pongamia coriacea, *Grah. in Wall. Cat.* 5905. Brachypterum scandens, *Dalz. & Gibs. Bomb. Fl.* 76.—*Rheede Hort. Mal.* vi. t. 22.

EASTERN HIMALAYAS, BENGAL, WESTERN PENINSULA, CHITTAGONG, SIAM, CEYLON. —DISTRIB. Malay isles, China, N. Australia.

A wide-climbing shrub, with branchlets and leaves below at first obscurely grey-downy. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ ft. long; leaflets rigidly subcoriaceous, oblong or obovate-oblong, short-stalked, bright green, 1–2 in. long. *Flowers* in very copious short-peduncled simple axillary racemes, often twice as long as the leaves, with raised nodes, produced sometimes into short branches, bearing each a cluster of pedicels $\frac{1}{6}$–$\frac{1}{4}$ in. long, the different flowers from the same node expanding at different times. *Calyx* $\frac{1}{8}$ in., thinly grey-silky; teeth obscure. *Corolla* pale rose, 3 times the length of the calyx. *Ovules* 6–8. *Pod* 1–3 in. by $\frac{3}{8}$–$\frac{1}{2}$ in., narrowed to both ends, 1–4-seeded, glabrous, turgid, and smooth against the seeds, the wing not more than $\frac{1}{24}$ in. broad.

2. **D. parviflora,** *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 105; scandent, leaflets 7–9 subacute equal at the base, flowers in simple racemes shorter than the leaves, pedicels 1–3-nate subequal. Brachypterum elegans, *Thwaites, Enum.* 93.

CEYLON, *Thwaites.*

A climber, quite glabrous in all its parts, even the pedicels and calyx. *Leaflets* rigidly subcoriaceous, oblong or obovate-oblong, 1½–2 in. long, green above, rather glaucous beneath. *Racemes* axillary, short-peduncled, 2–4 in. long; pedicels twice the length of the calyx. *Calyx* campanulate, $\frac{1}{12}$ in.; teeth deltoid, minute. *Corolla* ¼ in., the claws of the petals as long as the calyx. *Ovules* 2. *Pod* ligulate, glabrous, 1¾–2¾ in. by ½ in.

3. **D. robusta,** *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 104; erect, leaflets 7–19 usually acute oblique at the base, flowers in elongated racemes, pedicels unequal several to a fascicle exceeding the calyx. Dalbergia robusta, *Roxb. Hort. Beng.* 53; *DC. Prodr.* ii. 417; *Wight Ic.* t. 244. D. Krowee, *Roxb. Fl. Ind.* iii. 229. D. Crowei, *DC. Prodr. loc. cit.* Brachypterum robustum, *Dalz. & Gibs. Bomb. Fl.* 77.

EASTERN HIMALAYAS, WESTERN PENINSULA and CEYLON.

An erect tree, 30–40 ft. high, with branchlets and leaves below obscurely grey-silky. *Leaves* ¼–½ ft. long; leaflets 1–2 in. long, not so coriaceous as in *D. scandens*, green and glabrous above, grey and obscurely silky beneath. *Racemes* like those of *D. scandens*, but seldom exceeding the leaves, the flowers densely fascicled and nodes liable to be produced in the same way; pedicels ⅙–¼ in., finely grey-downy. *Calyx* $\frac{1}{12}$ in. long; teeth minute, deltoid. *Corolla* whitish, 3–4 times the calyx; standard erect, with a round blade. *Pod* 1–5-seeded, narrowed to both ends, glabrous, 1–2½ in. long, ⅜ in. broad, the wing more distinct than in *D. scandens*, sometimes $\frac{1}{12}$ in. broad.

4. **D. dalbergioides,** *Baker*; erect, leaflets 25–33 obtuse rather oblique at the base, racemes close shorter than the leaves, pedicels unequal densely fascicled.

MARTABAN, *Parish.* TENASSERIM, *Helfer.* MALACCA, *Maingay.*—DISTRIB. Java.

A small spreading tree, 15–20 ft. high, with branchlets, pedicels and calyx brown-silky. *Leaves* 6–8 in. long; leaflets close, short-stalked, not more than an inch long, rounded at both ends, emarginate, rigidly subcoriaceous, glabrous, dark green above, pale green beneath, the veins immersed. *Flowers* in copious short-peduncled racemes, like those of *D. scandens* and *robusta*, but the nodes more crowded; pedicels and calyx each about $\frac{1}{12}$ in. long; teeth minute, deltoid. *Corolla* rose-coloured, 4 times the length of the calyx; blade of the standard oblong. *Pod* just like that of *D. robusta.*

SECT. II. **Euderris.** Robust climbers, with the habit of *Millettia* and *Lonchocarpus. Leaflets* large. *Flowers* showy, in copious axillary racemes or panicles, with the nodes often produced into short branchlets. *Stamens* monadelphous. *Pods* flattened, broader than in the last group and distinctly winged down one or both sutures.

* *Pod distinctly winged down the upper suture only.*

† *Leaflets few; standard not callose at the base.* (Euderris, *Benth.*)

5. **D. uliginosa,** *Benth. Pl. Jungh.* i. 252; branches glabrous, leaflets 3–5 middle-sized rigidly subcoriaceous oblong subacute, flowers middle-sized in short-peduncled axillary racemes which are sometimes obscurely panicled. *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 107; *Dalz. & Gibs. Bomb. Fl.* 77. Pongamia uliginosa, *DC. Prodr.* ii. 416; *Wall. Cat.* 5879; *W. & A. Prodr.* 262. P. religiosa, *Wt. in Hook. Bot. Misc.* iii. 301. P. triphylla, *Wt. loc. cit. Suppl.* t. 41. Galedupa uliginosa, *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 243. Robinia uliginosa, *Willd. Sp. Pl.* iii. 1133. Dalbergia heterophylla, *Willd.*; *DC. Prodr.* ii. 417.

EASTERN HIMALAYAS, WESTERN PENINSULA and CEYLON.—DISTRIB. China, N. Australia, Polynesia, Madagascar, Zambesi-land.

A wide-climbing shrub, with branchlets and leaves quite glabrous from an early stage. *Leaves* distinctly petioled, $\frac{1}{4}$–$\frac{1}{2}$ ft. long; leaflets usually 5, distinctly stalked, narrowed to a point, 2–4 in. long, the lowest pair shorter, ovate, the veins not prominent on either surface. *Racemes* short-peduncled, 2–4 in. long, the lower nodes often produced into short branches; pedicels fascicled, as long as the calyx. *Calyx* campanulate, $\frac{1}{12}$ in., subglabrous; teeth obscure. *Corolla* rose-red, $\frac{3}{8}$ in. long; blade of standard round, not callose. *Pod* sessile, glabrous, 1–2-seeded, obliquely roundish or oblong, 1–1$\frac{1}{2}$ in. by 1 in., thin, flat, prominently veined, with a distinct narrow wing to the upper suture.—A plant gathered at Malacca by Griffith differs by its thicker and more rigid leaves and longer pedicels. It is referred by Bentham to D. trifoliata, *Lour. Fl. Cochin.* 433 (D. affinis, *Benth. Pl. Jungh.* i. 252), but the pod is unknown.

6. **D. vestita,** *Baker*; branches clothed with dense brown pubescence, leaflets 5 large obovate-oblong rigidly coriaceous, flowers middle-sized in sessile congested axillary racemes.

MALACCA, *Maingay.*

A climber, with the branches and under surface of the leaves densely covered with soft short brown pubescence. *Leaflets* 3–6 in. long, glabrous and rather glossy above, rather rounded at the base, pointed, with conspicuous main veins raised on the undersurface. *Panicles* 1–2 in. long, sometimes fascicled; pedicels equalling or rather exceeding the calyx. *Calyx* $\frac{1}{12}$ in., finely pubescent; teeth obscure. *Corolla* red, $\frac{3}{8}$ in. long; standard with a round not callose blade. *Pod* just like that of *D. uliginosa* in texture, veining and shape, but thinly clothed with fine brown pubescence.

7. **D. elegans,** *Benth. Pl. Jungh.* i. 252; branches clothed with fine brown pubescence, leaflets 5–7 large obovate-oblong subcoriaceous, flowers large in short sessile axillary racemes. *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 109. Pongamia elegans and P. floribunda, *Grah. in Wall. Cat.* 5883, 5884.

BIRMA; Phanoe and Trogla hills, *Wallich.* TENASSERIM, *Griffith.*

Leaves, including the petiole, a foot long, thin but subcoriaceous, thinly clothed beneath with evanescent fine brown pubescence; leaflets narrowed to a subobtuse point, rounded at the base, the end one 6–8 in. long. *Racemes* dense or sublax, 2–4 in. long, clothed with fine brown pubescence on the rachis and pedicels; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in., the lower nodes sometimes produced. *Calyx* under $\frac{1}{8}$ in., broadly campanulate; teeth obscure. *Corolla* bright red, $\frac{1}{2}$ in. long; blade of standard round, not callose. *Pod* just like that of *D. vestita.*

8. **D. paniculata,** *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 105; branchlets clothed with fine very short brown pubescence, leaflets 5–7 middle-sized obovate-oblong rigidly coriaceous, flowers very small in copious peduncled elongated panicles. Brachypterum Benthami, *Thwaites Enum.* 93.

CEYLON, *Walker, Thwaites.*

Branches slender, terete, soon glabrescent. *Leaflets* subacute, rounded at the base, thick and rigid in texture, 2–4 in. long, not prominently veined, glabrescent from an early stage. *Panicles* copious, reaching a foot long, with numerous slender curved branches, clothed with finely silky brown pubescence; pedicels $\frac{1}{12}$–$\frac{1}{6}$ in. *Calyx* $\frac{1}{12}$ in., between tubular and campanulate, brown-silky, with short obscure teeth. *Corolla* red, scarcely $\frac{1}{4}$ in. long. *Pod* 1–2-seeded, 1–2 in. by $\frac{3}{4}$ in., rigid in texture, turgid against the seeds, persistently brown-silky, not veined, with a wing under $\frac{1}{12}$ in. broad down the upper suture.

†† *Leaflets many. Standard with two callosities at the base of the limb.* (Paraderris, *Benth.*)

9. **D. oblonga,** *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 112; branches

subglabrous, leaflets 9–15 small oblong or oblanceolate-oblong, racemes much shorter than the leaves, standard glabrous, pod broad. D. ovalifolia, *Benth Pl. Jungh.* i. 252, *in part*; *Thwaites Enum.* 92. Pongamia elongata, *Grah. in Wall. Cat.* 5915, *not* 5886.

CONCAN, *Stocks.* CEYLON, *Gardner*, &c.

The most like a *Dalbergia* in foliage of the species of this section, but very different in the flowers. *Leaves* distinctly petioled, not more than half a foot long; leaflets the smallest of the group, 1½–2½ in. long by ½–¾ in., obtuse or subacute, quite glabrous, rigidly subcoriaceous when mature, rather glaucous beneath, the veins immersed. *Racemes* copious, moderately close, subsessile, many of the nodes produced into short spreading branchlets; pedicels rather exceeding the calyx, finely grey-silky. *Calyx* ⅛ in. long. *Corolla* ½ in. long; standard reflexed, nearly ½ in. broad. *Pod* one-seeded in all our specimens, oblong, 1½ in. by ¾–⅞ in., thin but firm, glabrous, with a distinct wing down the upper suture.

10. **D. cuneifolia,** *Benth. Pl. Jungh.* i. 253; branches subglabrous, leaflets 5-11 middle-sized obovate-oblong subcoriaceous, racemes much shorter than the leaves, standard glabrous, pod narrow. *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 112. Galedupa marginata, *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 241. Pongamia marginata, *Grah. in Wall. Cat.* 5896. P. cuneifolia and P. monadelpha, *Grah. in Wall. Cat.* 5887, 5906. P. obovata, *Wall. Cat.* 5897.

Eastern Himalayas, NIPAL, and SIKKIM; ascending to 5000 ft. in SILHET and EASTERN PENINSULA.

Leaves distinctly-petioled, ⅓–¾ ft. long; leaflets usually 5–7, moderately firm, slightly silky at first beneath, 3–5 in. long, subobtuse or acute, the veins immersed. *Flowers* very copious, the nodes of the racemes usually produced into branchlets; racemes sometimes fascicled; pedicels finely grey-downy, ⅛–⅙ in. *Calyx* ⅛ in., subglabrous, broadly campanulate. *Corolla* ⅜–½ in., bright red; blade of the standard round. *Pod* 1–3-seeded, 2–3 in. by ⅓–⅝ in., thin, flat, glabrous, with a narrow distinct wing down the upper suture and sometimes a trace of one on the lower.

11. **D. microptera,** *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 113; branches subglabrous, leaflets 5–9 large membranous obovate-oblong cuspidate, racemes long and lax, standard glabrous, pod broad.

SIKKIM, alt. 2–5000 ft., *Hook. fil.*

Closely allied to *D. cuneifolia*, and even more showy. *Leaves* a foot or more long, distinctly petioled; leaflets 3–6 in. long, twice as long as broad, membranous, green, glabrous on both surfaces from an early stage, with a very distinct cusp. *Racemes* peduncled, flexuose, ½–1 ft. long, with distant nodes, the axils and pedicels nearly glabrous, the nodes not produced into branchlets; pedicels ⅙–¼ in. *Calyx* ⅛ in., broadly campanulate. *Corolla* ½–⅝ in., bright red; standard erect, ⅜–½ in broad. *Pod* 1-2-seeded, 1½–3 in. by 1 in., glabrous, thin, firm; wing very narrow.

12. **D. elliptica,** *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 111; branches densely clothed with brown pubescence, leaflets 9–13 large subcoriaceous obovate-oblong, racemes lax elongated, standard silky on the back, pod narrow. Pongamia elliptica, *Wall. Pl. As. Rar.* iii. 20, t. 237; *Cat.* 5881; *Wight. Ic.* t. 420. Galedupa elliptica, *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 242. Pongamia dubia, *Grah. in Wall. Cat.* 5899. P. volubilis, *Zoll. & Moritz. Verz.* 3. P. Horsfieldii and hypoleuca, *Miq. Flor. Ind. Bat.* i. 148–9.

MARTABAN, BIRMA, PENANG, MALACCA.—DISTRIB. Siam, Malay isles.

A large handsome climber, easily distinguished from all the other species by its petals silky on the outside. *Leaves* long-petioled, a foot or more long; leaflets thin, but firm when mature green and glabrous above, glaucous and thinly brown-silky beneath,

4–6 in. long, usually twice as long as broad, obtuse or pointed. *Racemes* ½–1 ft. long, obtuse, very lax, with nodes copiously produced into branchlets, the axis and pedicels densely clothed with brown pubescence; pedicels ⅙–¼ in. *Calyx* very broad, densely silky. *Corolla* bright red, ¾ in. long; blade of standard round, ½–⅝ in. broad. *Pod* 2–3 in. by ¾ in., 1–3-seeded, thin, flat, with raised sutures, the upper one with a narrow distinct wing.

** *Pod more or less distinctly winged down both sutures* (Dipteroderris, *Benth.*)

13. **D. brevipes,** *Baker*; leaflets 5–7 glabrous obovate-oblong middle-sized acute or subobtuse, racemes copiously panicled with densely pubescent branches, pedicels shorter than the calyx, corolla middle-sized, pod persistently silky the lower wing obscure. Derris Heyneana, var. brevipes, *Benth in Journ. Linn. Soc.* iv. *Suppl.* 110.

CONCAN, *Stocks.* NILGHIRIS, *Hohenacker.* MYSORE, *Cleghorn.*

Branches and leaves on both surfaces glabrous. *Leaflets* moderately firm, 2–3 in. long, rounded at the base, obtuse or acute, the upper surface rather glossy, the veins below little raised, the colour grey-green. *Flowers* crowded on the short branchlets of copious ample axillary panicles, which are as long as the leaves, with ascending branches, densely clothed with short brown pubescence. *Calyx* under ⅛ in., densely silky. *Corolla* red, 3 times the length of the calyx; standard obovate, not callose. *Pod* broad, oblong, 1-seeded, 1¼–1½ in. by 1 in., persistently brown-silky, with a narrow wing down the upper and a very obscure one down the lower suture.

VAR. *coriacea*, Benth.; leaflets much thicker and very rigid glossy above, flowers nearly sessile.—Nilghiris, *Hohenacker*, 1598.

14. **D. eualata,** *Bedd. Ic. Pl. Ind. Or.* 42, t. 186; leaflets 7-9 oblong middle-sized obtusely pointed, racemes copiously panicled with densely pubescent branches, pedicels as long as the calyx, corolla middle-sized, pod glabrous, lower wing as broad as upper.

WESTERN PENINSULA; common in plains of South Canara and Malabar, and at the foot of the Coorg ghauts, *Beddome.*

A gigantic creeper, with brown silky branchlets. *Leaflets* subcoriaceous, glabrous, 2–3 in. long, the veinlets little raised. *Flowers* in axillary racemes and an ample panicle often 1 ft. long at the end of the branches; pedicels fascicled, ⅛–⅙ in. *Calyx* ⅛–⅙ in., densely brown-silky. *Corolla* reddish, scarce ½ in.; standard not callose. *Pod* ligulate, thin, 4–5 in. by 1–1¼ in., 1–3-seeded, each wing ⅙ in. broad.

15. **D. Heyneana,** *Benth. Pl. Jungh.* i. 252; leaflets 5 glabrous obovate-oblong middle-sized subobtuse, racemes copiously panicled with obscurely grey-downy branches, pedicels as long or longer than the calyx, corolla small, pod glabrous with a distinct wing down the lower suture. *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 110; *Dalz. & Gibs. Bomb. Fl.* 77. Pongamia Heyneana, *Grah. in Wall. Cat.* 5916.

MYSORE, *Heyne.* CONCAN, *Stocks, Law.*

A slender climber, glabrous in all its parts, except the branches of the panicle. *Leaflets* moderately firm, grey-green, obtusely pointed, broadly rounded at the base, 2–4 in. long, the veins immersed. *Panicles* copious, axillary, as long as the leaves, with numerous very slender ascending branches, with the subdistant nodes produced into short branchlets; pedicels $\frac{1}{12}$–⅙ in. *Calyx* $\frac{1}{12}$ in., subglabrous. *Corolla* rose-red, ¼–⅓ in.; blade of standard roundish. *Pod* oblong or ligulate, 1–3-seeded, 1½–4 in. by ⅞–1 in., thin, firm, rather glossy and veined, the wing of the upper suture ⅛–⅙ in. broad, of the lower much narrower.

VAR. *paniculata*; leaflets 5–7 considerably smaller and especially narrower, panicles a foot long very lax with branches clothed with fine silky pubescence, pedicels

3 times as long as the calyx. P. paniculata, *Wight, Herb.* 920. P. Heyneana, *W. & A. Prodr.* 263.—Western Peninsula, *Wight.*

16. **D. marginata,** *Benth. Pl. Jungh.* i. 232; leaflets 5–7 large subcoriaceous obovate-oblong glabrous, racemes copiously panicled with glabrous branches, pedicels 3–4 times the calyx, corolla middle-sized, pod glabrous very distinctly winged down the lower suture. *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 111. Dalbergia marginata, *Roxb. Hort. Beng.* 53; *Fl. Ind.* iii. 241; *Wight. Ic.* t. 87. Pongamia emarginata, *Wall. Cat.* 5909. P. reflexa, *Grah. in Wall. Cat.* 5898.

EASTERN HIMALAYAS, tropical zone, KHASIA and SILHET, ascending to 3000 ft.

A showy climber, glabrous in all its parts. *Leaves* ½–¾ ft. long; leaflets moderately firm, rather glossy above, ¼–½ ft. long, narrowed into a distinct cusp, the veins little raised. *Panicles* as long as the leaves, with several spreading slender lax-flowered branches; pedicels usually solitary, ⅛ in. long. *Calyx* $\frac{1}{12}$ in., broader than deep when expanded. *Corolla* pale red, ½–⅝ in. long; standard ¼ in. broad, not callose. *Pod* thin, flat, ligulate-oblong, glabrous, flexible, finely veined, 3–4 in. by 1¼–1½ in., the upper wing ¼–⅓ in. broad, the lower narrower,

17. **D. platyptera,** *Baker*; leaflets 5–7 large subcoriaceous oblong subacute glabrous, racemes copiously panicled with silky branches, pedicels as long as the calyx, corolla middle-sized, pod glabrous very distinctly winged down the lower suture.

MALABAR; near Calicut, *Wight.*

Branches glabrous. *Leaves* ½–¾ ft. long; leaflets obtusely pointed, 3–6 in. long, broadly rounded at the base, thin, flexible, finely reticulato-venulose; petiolules ⅛ in. *Panicles* as long as the leaves, with numerous short ascending fine silky branches; pedicels close, but not fascicled. *Calyx* ⅙ in., subtruncate, finely silky. *Corolla* under ½ in. *Pod* 3–4 in. by 1 in., including the wings, thin, flat, glossy, glabrous, reticulato-venulose, one-seeded, narrowed to both ends, the upper wing ¼ in. broad.

18. **D. amœna,** *Benth. Pl. Jungh.* i. 252; leaflets 5–7 subcoriaceous glabrous middle-sized not glaucous beneath, racemes in copious panicles with glabrous branches, corolla small, pedicels exceeding the calyx, pod glabrous narrowly winged down the lower suture. *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 110. Pongamia amœna, *Wall. Cat.* 5912.

MARTABAN, *Wallich.* TENASSERIM, *Griffith.* MALACCA, *Maingay.*

A climber, glabrous in all its parts. *Leaves* about ½ ft. long: leaflets moderately firm, glossy above, 3–4 in. long, oblong-cuspidate, the veins not prominent. *Panicles* equalling or exceeding the leaves, the nodes often produced into branchlets, the flowers close and pedicels densely fascicled; pedicels ⅛–⅙ in. *Calyx* $\frac{1}{12}$ in. *Corolla* under ¼ in., bright red. *Pod* thin, glabrous, ligulate-oblong, flexible, finely veined, 3–4 in. by 1–1¼ in., the upper wing ⅛ in. broad, the lower distinct, but much narrower.

19. **D. Maingayana,** *Baker*; leaflets 5–7 oblong rigidly coriaceous middle-sized glabrous glaucous beneath, flowers in panicled racemes with glabrous branches, corolla middle-sized, pedicels equalling or rather exceeding the calyx, pod glabrous narrowly winged down the lower suture.

SINGAPORE, *Maingay.*

Closely allied to *D. amœna*, with which it agrees in general habit, pod and inflorescence, differing in its rather larger more rigidly coriaceous leaves glaucous beneath, and larger flowers, which are ⅜ in. long with a standard with a round ecallose wing, rounded suddenly to a long claw.

20. **D. ferruginea,** *Benth. Pl. Jungh.* i. 252; leaflets 5–9 large obovate-oblong finely ferrugineo-pubescent beneath, racemes copiously panicled with

densely pubescent branches, pedicels exceeding the calyx, corolla middle-sized, pod finely pubescent with the wing down the lower suture distinct or obscure. *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 109. Robinia ferruginea, *Roxb. Fl. Ind.* iii. 329. Pongamia ferruginea, *Wall. Cat.* 5885. P. oblonga, *Wall. Cat.* 5893.

EASTERN HIMALAYAS, tropical zone, ASSAM and SILHET. BIRMA, *Wallich.*

Branchlets clothed with dense ferruginous pubescence. *Leaflets* 4–6 in. long, cuspidate or subobtuse, rounded at the base, subcoriaceous, green and glabrous above, finely pubescent, especially on the main raised veins beneath. *Panicles* axillary, peduncled, $\frac{1}{2}$–1 ft. long, with slender ascending branches, clothed with dense ferruginous pubescence; pedicels $\frac{1}{4}$ in., fascicled and nodes often produced into branchlets. *Calyx* $\frac{1}{8}$ in.; teeth deltoid, minute. *Corolla* rose-red, three times the length of the calyx; standard emarginate, $\frac{1}{4}$ in. broad. Young *pod* densely brown-silky; old nearly glabrescent, 2–3 in. by 1 in., oblong or ligulate-oblong, rigid in texture, obscurely veined on the faces, the sutures much raised, the wing of the upper $\frac{1}{8}$–$\frac{1}{6}$ in. broad, the wing of the lower one sometimes not perceptible.

21. **D. canarensis,** *Baker;* leaflets 15–21 middle-sized oblanceolate-oblong pubescent beneath, flowers in terminal panicles with pubescent branches, standard callose, pod winged down the lower suture. Pongamia canarensis, *Dalz. in Hook. Kew Journ.* ii. 37. Brachypterum canarense, *Dalz & Gibs. Bomb. Fl.* 76.

CONCAN, near Garsuppa, *Dalzell.*

Leaves a ft. long; leaflets 2–2$\frac{1}{2}$ in. by $\frac{1}{2}$ in., glabrous above. *Panicles* terminal, shorter than the leaves; racemes simple, the branches ferrugineo-pubescent; pedicels fascicled in threes. *Corolla* reddish. *Ovary* hirsute, 2–3 ovuled. *Pod* flat, oval or elliptic, pointed at both ends winged on both sides, 1$\frac{1}{2}$ in. long. *Dalzell, loc. cit.*—Appears to connect *Paraderris* and *Dipteroderris.*

SECT. III. **Aganope,** *Miquel.* Habit of *Euderris,* but the racemes in ample thyrsoid panicles, with the nodes not produced into branchlets, and the upper stamen distinctly free from the rest down to the base.

22. **D. sinuata,** *Thwaites Enum.* 93; leaflets subobtuse half as long again as broad, pedicels as long as the calyx, pod large deeply indented between the seeds narrowly winged down the upper suture. *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 113. Pongamia sinuata, *Wall. Cat.* 5911. P. grandifolia, *Grah. in Wall. Cat.* 5882, *not Zoll. & Moritz.*

PEGU, MARTABAN, TENASSERIM, MALACCA, CEYLON.—DISTRIB. Malay isles.

A robust climber, with glabrous branches and leaves. *Leaflets* 5–7, ovate- or obovate-oblong, 4–6 in. long, rigidly coriaceous, all but the main veins immersed. *Panicles* $\frac{1}{2}$–1 ft. long, with numerous ascending thinly brown-silky branches; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in. *Calyx* $\frac{1}{6}$ in., thinly silky, broadly campanulate, circumscissile above the base. *Corolla* $\frac{1}{2}$ in., turning dark purple when dried; standard erect, with a round ecallose blade. *Pod* very different from that of any of the other species, 1–4-seeded, 2–8 in. by 1–1$\frac{1}{4}$ in., smooth, firm, finely veined, the wing usually not more than $\frac{1}{24}$ in. broad, and sometimes not perceptible.

23. **D. thyrsiflora,** *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 114; leaflets acute twice as long as broad, pedicels close very short, pod comparatively small not indented between the seeds, both sutures distinctly winged. Millettia thyrsiflora, *Benth. Pl. Jungh.* 249. Amerimnum obovatum, *Hamilt. MSS.* Pongamia? *Wall. Cat.* 9054. Aganope floribunda, *Miq. Fl. Ind. Bat.* i. 151.

EASTERN HIMALAYAS and the KHASIA Mts., ascending to 4000 ft.; EASTERN PENINSULA.—DISTRIB. Malay isles.

A robust climber, with glabrous branches and leaves. *Leaflets* 5–9, oblong or

obovate-oblong, rigidly subcoriaceous, 4–6 in. long, the veinlets distinct in the dried specimens. *Panicles* ½–1 ft. long, with very numerous ascending or spreading branches, clothed with dense brown-silky pubescence, the upper ones growing gradually shorter; pedicels crowded, but not fascicled, much shorter than the calyx. *Calyx* ⅛ in., thinly silky. *Corolla* whitish, 3–4 times the calyx. *Pod* 1–3-seeded, 1¼–3½ in. by 1–1¼ in., thin, flat, glabrous, finely-veined, each wing ⅛–⅙ in. broad.

DOUBTFUL SPECIES.

Of the following species of § Euderris the fruit is unknown.

D. ACUMINATA, *Benth. Pl. Jung.* i. 252. (Pongamia elongata, *Grah. in Wall. Cat.* 5886, *non* 5915. P. acuminata, *Grah. in Wall. Cat.* 5901.) A large climber, with glabrous branches and leaves. *Leaflets* 5–7, elongate-oblong, 4–6 in. long, with a long very distinct cusp, green on both surfaces, with the main veins raised below. *Racemes* 6–9 in. long, the flowers fascicled at the distant nodes, the rachis, pedicels and calyx with a little brown pubescence; pedicels ⅛–⅙ in., equalling or exceeding the calyx. *Corolla* rose-red, ⅜ in. long. *Ovary* silky, 5–6-ovuled.—NIPAL, *Wallich*; and a plant with 9–11 leaflets of similar shape, and shorter closer racemes of considerably larger (⅝ in. long) bright purple flowers in SIKKIM, *Hook. fil.* This last closely resembles *D. microptera*, but the standard is not callose.

D. SECUNDA, *Baker.* (Pongamia secunda, *Grah. in Wall. Cat.* 5890. Amerimnum secundum, *Hamilt. MSS.*) *Leaflets* 7, oblong with a long cusp, 2–3 in. long, rigidly coriaceous, glabrous rather shining above, the veins immersed. *Racemes* like those of *D. scandens*, but in a terminal panicle and in the axils of upper leaves; rachis and pedicels finely brown-silky, the latter densely fascicled, exceeding the calyx. *Calyx* $\frac{1}{12}$ in. *Corolla* reddish, ⅜ in., the blade of the standard oblong, not callose. *Ovary* silky.—ASSAM, *Hamilton.*

D. POLYSTACHYA, *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 114. *Branches* and leaves below glabrous. *Leaflets* 5–7, subcoriaceous, acuminate, pale green on both surfaces, twice as long as broad, 3–4 in. long, with a distinct point. *Racemes* long and narrow, ½–1 ft. long, from the upper leaves and forming an end panicle, the nodes copiously produced into branchlets, the rachises finely obscurely pubescent; pedicels exceeding the calyx, crowded on the branchlets. *Calyx* ⅛ in., slightly pubescent. *Corolla* ⅜–½ in., rose-red. *Ovary* silky, with about 4 ovules.—KHASIA, 2–4000 ft., *Hook. fil. & Thomson.*

D. OVALIFOLIA, *Benth. Pl. Jungh.* i. 252, *ex parte.* (Pongamia ovalifolia, *W. & A. Prodr.* 262; *Wight Ic.* t. 328.) A climber, glabrous in all its parts, with general habit and leaves very like *Dalbergia volubilis.* *Leaflets* 9, long-stalked, oblong, obtuse, emarginate, 1½–2 in. long, membranous, with raised veinlets. *Racemes* copious, axillary, ½ ft. long, sometimes geminate, with nodes produced and very abundant small bright red flowers; pedicels twice the calyx. *Calyx* $\frac{1}{12}$ in., broadly campanulate. *Corolla* ¼ in.; standard with a long claw and a broad blade, not callose. *Ovary* slightly hairy, 2-ovuled.—WESTERN PENINSULA, *Wight.*

The following are probable species of § *Dipteroderris*, of which the flowers are unknown.

D. DISCOLOR, *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 111. A robust climber, glabrous throughout. *Leaves* long-petioled; leaflets 5–9 obovate-oblong, 3–5 in. long, obtusely pointed, bright green above, very glaucous below, rigidly coriaceous, with immersed veins. *Pod* oblong, 1 seeded, thicker than in the other species, 1¼–1½ in. by ¾–⅞ in., both sutures raised and furnished with a narrow distinct wing.—SIKKIM and SILHET, *Hook. fil. & Thomson.* A different type of the pod to the admitted species, like that of *Pongamia glabra* in shape and texture, but with a double wing.

D. WIGHTII, *Baker.* A slender glabrous climber. *Leaflets* 5–7, oblong, obtusely pointed, broadly rounded at the base, 1–1¼ in. long, rigidly subcoriaceous, with immersed veins, pale grey-green on both surfaces. *Racemes* much exceeding the leaves

with produced nodes. *Pod* 1–2-seeded, 1–2 in. by ½–⅝ in., thin, but firm, rather veined, persistently brown-silky, with a narrow wing down the upper and a very obscure one down the lower suture.—WESTERN PENINSULA; Shevagerry hills, *Wight.* Pod clothed like that of *D. brevipes*, but narrower and leaves much smaller.

90. **EUCHRESTA,** Bennett.

Shrubs. *Leaves* odd-pinnate. *Flowers* racemed. *Calyx* deeply campanulate, very oblique; teeth 5, deltoid, very short. *Corolla* much exserted; standard narrow; keel obtuse, its petals scarcely cohering. *Stamens* diadelphous (9, 1), but the filaments fastened very slightly; anthers versatile. *Ovary* long-stalked, 1–2-ovuled; style filiform, stigma capitate. *Pod* the size of an olive, turgid, rather fleshy, filled up with the solitary seed.—DISTRIB. Species 2, the other Japanese.

1. **E. Horsfieldii,** *Bennett Pl. Jav. Rar.* 148, t. 31; *Benth. in Journ. Linn. Soc.* iv., *Suppl.* 118. Andira Horsfieldii, *Lesch. in Ann. Mus.* 16, 481, t. 12; *DC. Prodr.* ii. 476.

KHASIA MTS., *Hook. fil. & Thomson.*—DISTRIB. Java, Formosa.

An erect shrub, with glabrous leaves and branches. *Leaves* long-petioled; leaflets 3–5, oblong, acute, ½ ft. long, subcoriaceous, opposite, subsessile, pale green, the veins immersed. *Flowers* (not seen in Indian specimens) in simple peduncled racemes; pedicels geminate, minutely bracteate, shorter than the calyx. *Corolla* pure white, ½ in. long, twice the length of the calyx. *Pod* oblong, purplish-black, ½–⅝ in. long.

91. **DALHOUSIEA,** Grah.

A climbing shrub. *Leaves* 1-foliolate. *Flowers* in axillary corymbs. *Calyx* campanulate; teeth short, deltoid. *Corolla* exserted; petals equal in length; standard broad; keel obtuse. *Stamens* free; anthers uniform, oblong, versatile. *Ovary* subsessile, few-ovuled; style filiform, stigma capitate. *Pod* oblong, subcompressed, dehiscent, rigidly coriaceous, continuous within, 1–3-seeded.—A single species, with a peculiar distribution, as it is known only in the East Himalayas and Angola.

1. **D. bracteata,** *Grah. in Wall. Cat.* 5339; *Wight Ic.* t. 265. Podalyria bracteata, *Roxb. Cor. Pl.* iii. t. 259; *Fl. Ind.* ii. 317.

EASTERN HIMALAYAS, tropical region, ASSAM, SILHET, and CHITTAGONG.

A subscandent shrub, with slender finely grey-downy branches. *Leaves* simple, distinctly petioled, oblong, acute or obtuse, rigidly subcoriaceous, glabrous, 4–12 in. long; stipules small, lanceolate, subpersistent. *Flowers* in sparse lax subsessile axillary corymbs about as long as the petioles, terminal on the branchlets, which have several pairs of round membranous large persistent striated bracts; bracteoles like the bracts, but larger, completely hiding the flowers. *Calyx* ⅛ in., silky. *Corolla* whitish, twice the length of the calyx. *Pod* 2–4 in. long, the thick discoid seeds an inch broad.

92. **SOPHORA,** Linn.

Trees or shrubs. *Leaves* odd-pinnate. *Flowers* showy, yellow or violet-purple, racemed or panicled. *Calyx* oblique, broadly campanulate; teeth deltoid, very short. *Corolla* much exserted; standard broad; petals equal in length, all with long claws; keel obtuse, or appendiculate in § *Goebelia*, with a small hooked mucro. *Stamens* free, or obscurely connate at the very base; anthers uniform, versatile. *Ovary* stalked, many-ovuled; style incurved, stigma

capitate. *Pod* moniliform, sublignose or membranous in our species, usually indehiscent, the joints turgid, terete or in § *Edwardsia* furnished with four wings.—DISTRIB. Species above 20, widely spread in warm countries.

§ **Eusophora.** *Pod* wingless. *Keel* obtuse, without a mucro.

* *Stipules persistent, spiny. Pod finally dehiscing.*

1. **S. Moorcroftiana,** *Benth. MSS.* Astragalus Moorcroftianus, *Wall. Cat.* 5933. Caragana Moorcroftiana, *Benth. in Royle Ill.* 198.

Western Tibet. LADAK, *Moorcroft.* NUBRA valley, alt. 10–12,000 ft., *Thomson.* KASHMIR, *Bellew.*—DISTRIB. Kashgar, *Bellew.*

A low copiously-branched shrub, with densely grey-downy branches, armed with fine pungent spines, which are the stipules that persist, as in *Caragana*, long after the leaves fall. *Leaves* $1\frac{1}{2}$–2 in. long; leaflets 11–17, caducous, obovate, obtuse, with a long awn, $\frac{1}{4}$–$\frac{1}{2}$ in. long, subcoriaceous, pale green, finely grey-silky on both surfaces, finally nearly glabrescent. *Flowers* in copious sparse axillary racemes; pedicels shorter than the calyx. *Calyx* $\frac{1}{4}$ in., densely grey-silky; teeth short. *Corolla* yellow, more than twice the length of the calyx; blade of standard oblong. *Pod* thinner than in the other species, 3–4 in. long, 5–6-seeded, densely pubescent.

** *Small spineless trees with usually indehiscent pods.*

2. **S. tomentosa,** *Linn.*; *DC. Prodr.* ii. 95; leaflets 15–19 obovate obtuse densely grey-downy beneath, pedicels as long as the densely grey-downy calyx, flowers yellow, pod finely grey-downy. *Wall. Cat.* 5333; *Roxb. Fl. Ind.* ii. 316; *W. & A. Prodr.* 179; *Bedd. Fl. Sylv.* 89. S. glabra, *Hassk.*; *Miq. Flor. Ind. Bat.* i. 125.

Shores of the EASTERN and WESTERN PENINSULAS, and CEYLON.—DISTRIB. Cosmopolitan in the Tropics.

Branchlets virgate, thinly persistently grey-downy. *Leaves* $\frac{1}{2}$ ft. long; leaflets flexible, subcoriaceous, 1–2 in. long, dull grey-green, thinly downy above, the veins immersed on both surfaces. *Racemes* terminal, $\frac{1}{2}$ ft. long; pedicels densely silky, articulated a little below the calyx. *Calyx* $\frac{1}{4}$–$\frac{3}{8}$ in., nearly truncate, very oblique. *Corolla* $\frac{5}{8}$–$\frac{3}{4}$ in.; blade of standard round, veined. *Pod* $\frac{1}{4}$–$\frac{1}{2}$ ft. long, 6–8-seeded, the oblong hoary joints separated by a narrow neck as long as themselves.

3. **S. violacea,** *Thwaites Enum.* 94; leaflets 19–21 oblong obtuse glabrous, pedicels as long as the subglabrous calyx, flowers violet, pod glabrous. *Bedd. Fl. Sylv.* 90.

CEYLON; Galle district, *Thwaites.*

A middle-sized shrub. *Branches* slender, virgate, obscurely silky at first. *Leaves* $\frac{1}{2}$–$\frac{3}{4}$ ft. long; leaflets subdistant, membranous, glabrous, $\frac{3}{4}$–1 in. long, bright green above, glaucous beneath. *Racemes* axillary, close, short-peduncled, 3–4 in. long; pedicels very slender, articulated below the apex. *Calyx* very oblique, both at the base and throat; teeth obscure. *Corolla* twice the length of the calyx; blade of standard oblanceolate-spathulate, $\frac{1}{4}$ in. broad, with a very long claw. *Pod* 3–4 in. long, 4–6-seeded; joints oblong, veined, hard, with a narrow neck between them.

4. **S. glauca,** *Lesch.*; *DC. Prodr.* ii. 95; leaflets 21–25 acute densely silky beneath, pedicels shorter than the densely silky calyx, flowers purple, pod persistently velvety. *Wall. Cat.* 5334; *W. & A. Prodr.* 179; *Wight Ic.* t. 979; *Bedd. Fl. Sylv.* 89. S. velutina, *Lindl. Bot. Reg.* t. 1185. Edwardsia maderaspatana, *Wight Ic.* t. 1054 (*except the pods*).

Hills of the WESTERN PENINSULA.

Branches clothed with dense persistent grey or brown velvety pubescence. *Leaves* $\frac{1}{2}$ ft.; leaflets oblong, not acuminate, rarely subobtuse, $\frac{3}{4}$–1 in. long, subcoriaceous,

green, glabrescent above, densely grey-silky beneath, finally nearly glabrescent, the hairs on the midrib brown, the veinlets immersed. *Racemes* dense, terminal, short-peduncled, $\frac{1}{4}$–$\frac{1}{2}$ ft. long; pedicels densely silky. *Calyx* $\frac{1}{4}$ in.; teeth distinct. *Corolla* twice as long as the calyx; blade of standard obovate, $\frac{1}{4}$ in. broad. *Pod* 3–4 in. long, moderately firm, 5–6-seeded, finally dehiscing, but little moniliform when all the seeds are matured.

5. **S. heptaphylla,** *Linn.*; *DC. Prodr.* ii. 96; leaflets 7–13 oblong acuminate glabrescent beneath, pedicels exceeding the finely silky calyx, corolla small yellow, pod glabrous. *Arn. Pug.* 10; *Bedd. Fl. Sylv.* 89, *ex parte.*

CEYLON, alt. 4–7000 ft.—DISTRIB. China.

Branchlets at first brown-silky. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ ft.; leaflets conspicuously alternate, subcoriaceous, bright green above, 2–3 in. long, the veins rather raised on both surfaces, glaucous beneath, rounded at the base. *Racemes* short-peduncled, moderately close, $\frac{1}{4}$–$\frac{1}{2}$ ft long; pedicels $\frac{1}{4}$–$\frac{1}{3}$ in., articulated at the middle, thinly silky, the lower in pairs. *Calyx* $\frac{1}{8}$ in., thinly silky at first. *Corolla* twice the length of the calyx. *Pod* 2–3 in. long, rigidly coriaceous, 2–4-seeded, the joints oblong, $\frac{1}{2}$–$\frac{5}{8}$ in. broad, with a broad neck between them when the seeds all mature, the faces distinctly veined.

6. **S. Wightii,** *Baker*; leaflets 11–15 oblong acuminate thinly pubescent beneath, pedicels exceeding the finely silky calyx, corolla middle-sized yellow, pod glabrous. S. heptaphylla, *Wight Ic.* t. 1155; *Dalz. & Gibs. Bomb. Fl.* 79; *Bedd. Fl. Sylv.* 89, *in part, non Linn.*

Hills of the WESTERN PENINSULA, Mysore, *Cleghorn.*

Branchlets persistently brown-velvety. *Leaves* $\frac{1}{2}$ ft. long; leaflets subcoriaceous, 2–3 in. long, bright green above, very glaucous with a thin coating of bright brown pubescence, especially on the midrib beneath, the veinlets on both sides rather raised. *Racemes* lax, axillary, short-peduncled, as long as the leaves; pedicels twice the calyx. *Calyx* $\frac{1}{4}$ in., oblique at the mouth, persistently brown-silky; teeth obscure. *Corolla* more than twice the length of the calyx. *Pod* 3–4 in. long, firm, indehiscent; joints oblong, distinctly veined on the faces with a deep constriction between them.

7. **S. acuminata,** *Benth. MSS.*; leaflets 15–19 oblong acuminate obscurely silky beneath, pedicels shorter than the finely silky calyx, corolla yellow middle-sized, pod glabrous. Ormosia acuminata, *Wall. Cat.* 5973.

EASTERN BENGAL and the EASTERN HIMALAYAS, tropical zone, ascending to 4000 ft.; KHASIA, ASSAM, BHOTAN, MISHMI.

Branchlets thinly grey-silky at first, soon glabrescent. *Leaves* $\frac{3}{4}$–1 ft.; leaflets subcoriaceous, 3–4 in. long, narrowed to a very long point, the upper cuneate, the lower rounded at the base, bright green above, glaucous beneath, with a few obscure adpressed hairs. *Racemes* peduncled, moderately close, axillary much shorter than the leaves. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in., very oblique, membranous, thinly grey-silky; teeth obscure. *Corolla* bright yellow, more than twice the length of the calyx. *Pod* 3–5 in. long, 3–4-seeded, moderately firm, indehiscent, with deep constrictions between the oblong strongly-veined joints.

§§ **Goebelia,** *Bunge in Boiss. Fl. Orient.* ii. 628, *Gen.* *Pod* wingless, indehiscent. *Keel* appendiculate, with a mucro like *Oxytropis.*

8. **S. alopecuroides,** *Linn.*; *DC. Prodr.* ii. 96. Goebelia alopecuroides, *Bunge loc. cit.*

WESTERN TIBET, temperate region, alt. 10–12,000 ft., *Thomson, Falconer.*—DISTRIB. Afghanistan, Orient.

An undershrub, with virgate branches, clothed with short adpressed grey pubescence. *Leaves* $\frac{1}{2}$ ft. long; leaflets 15–25, pale green, oblong, subcoriaceous, obtuse, $\frac{3}{4}$–1 in. long, thinly grey-downy above, densely beneath. *Flowers* in dense terminal racemes $\frac{1}{2}$ ft. long; pedicels shorter than the calyx. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in., very oblique,

densely pubescent; teeth distinct, deltoid. *Corolla* bright yellow, 3 times the length of the calyx. *Pod* $\frac{1}{4}$ in. broad, sublignose, finely downy, 6–12-seeded, the seeds close and constrictions slight except where the ovules do not develop.

§§§ **Edwardsia,** *Salisb.* *Pod* furnished with four distinct wings.—*Keyserlingia,* Bunge.

9. **S. mollis,** *Grah. in Wall. Cat.* 5335; flowers smaller developed before the leaves in short crowded racemes. Edwardsia mollis, *Royle Ill.* t. 32, fig. 2. Sophora Houghiana, *Wall. Cat.* 5336 B.

Plains and low hills of the north-west; HAZARA and the SALT RANGE to KUMAON and NIPAL, ascending to 4000 ft.

A low spineless shrub, with finely grey-downy branches, the flowers developed first in copious short simple ascending racemes, the leaves appearing with the fruit. *Leaves* $\frac{1}{2}$ ft. long; leaflets 21–25, rigidly coriaceous, pale, grey green, $\frac{1}{2}$–$\frac{3}{4}$ in. long, obtuse, emarginate, prominently veined, finely grey-downy. *Racemes* 2–3 in. long; pedicels equalling or exceeding the calyx. *Calyx* $\frac{1}{6}$–$\frac{1}{4}$ in., very oblique, finely grey-downy. *Corolla* yellow, $\frac{5}{8}$–$\frac{3}{4}$ in. *Pod* glabrous, 3–4 in. long, 5–6-seeded, the joints with four distinct crustaceous wings and separated by distinct constrictions.

VAR. *hydaspidis*; leaves and calyx more densely and persistently silky, flowers larger.—Salt Range, Punjab.

10. **S. interrupta,** *Bedd. Ic. Pl. Ind. Or.* t. 165; *Fl. Sylv.* 90; *Anal. Gen.* t. 12, fig. 6; flowers larger developed at the same times as the leaves in their axils. Edwardsia maderaspatana, *Wight Ic.* t. 1054, *as regards the fruit.*

Hills of MYSORE, alt. 2500–3000 ft., *Wight, Beddome.*

A tall erect shrub. *Leaves* $\frac{1}{2}$–$\frac{3}{4}$ ft. long; leaflets 19–29, obtuse, emarginate, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, thinner than in the last, with a few obscure hairs beneath. *Racemes* distinctly peduncled, shorter than the leaves; pedicels twice the length of the calyx. *Calyx* $\frac{1}{4}$ in., very oblique, obscurely silky. *Corolla* bright yellow, $\frac{3}{4}$–$\frac{7}{8}$ in. long; blade of standard round. *Pod* just like that of *S. mollis.*—This is doubtless the plant intended by Wight, but all except the fruit in the plate appears to be drawn from *S. glauca.*

IMPERFECTLY KNOWN SPECIES.

A plant from the top of Parasnath, in Behar, seen in pod only, doubtless a new species, comes nearest to *S. Wightii,* but the 13–15 leaflets are obtuse, with thinner texture and finer veining, and the joints of the fruit smaller, with a tendency to dehisce down the sutures.

93. **CALPURNIA,** E. Meyer.

Shrubs or trees. *Leaves* odd-pinnate, with numerous leaflets. *Flowers* yellow, racemed or panicled. *Calyx* broadly campanulate; teeth deltoid. *Corolla* much exserted; petals equal in length; keel obtuse, rather incurved, its petals cohering. *Stamens* free; anthers small, oblong, versatile. *Ovary* linear stalked, many-ovuled; style filiform, stigma capitate. *Pod* strap-shaped, flat, membranous, many-seeded, indehiscent, with a narrow wing down the dorsal suture.—DISTRIB. Species 6, the others Cape and Abyssinian.

Virgilia capensis, Lam., a well-known Cape plant, allied to *Calpurnia,* is included in Hohenacker's Nilghiry plants, but is only cultivated in India.

1. **C. aurea,** *Baker in Oliv. Flor. Trop. Afric.* ii. 252; *Bedd. Fl. Sylv.* 89; *Anal. Gen.* t. 12, fig. 5. Virgilia aurea, *Lam.*; *DC. Prodr.* ii. 98; *W. & A. Prodr.* 179. Robinia Heynei, *Wall. Cat.* 5653.

WESTERN PENINSULA, near Courtallum, and on the Denkinacottah hills in mountain jungles.—DISTRIB. Abyssinia.

Branches slender, finely grey-silky. *Leaflets* 13–21, membranous, oblong, obtuse, glabrous, 1–1½ in. long. *Racemes* copious, short-peduncled, as long as the leaves; pedicels finely silky, much exceeding the calyx. *Calyx* ⅛–¼ in. *Pod* pliable, 3–4 in. long, 5–6-seeded, glabrous.

94. **PERICOPSIS,** Thwaites.

A tree. *Leaves* odd-pinnate, with large coriaceous leaflets. *Flowers* racemed or panicled. *Calyx* large, cleft to below the middle, the upper teeth shortest, subconnate. *Corolla* little exserted; standard round, reflexed, rather shorter than the obtuse wings and keel. *Stamens* free, as long as the corolla, recurved at the end; anthers uniform, versatile. *Ovary* stalked, few-ovuled; style long, filiform, recurved at the end, stigma oblique. *Pod* like that of a *Derris*, rigid, indehiscent, flattish, strap-shaped, with a narrow wing down each suture.—DISTRIB. A single species, endemic in Ceylon.

1. **P. Mooniana,** *Thwaites Enum.* 413; *Bedd. Fl. Sylv.* t. 187. Dalbergia Mooniania, *Thwaites Enum.* 93. D. lanceolaria, *Moon Cat.* 51, *non Linn.*

CEYLON, southern and central districts, *Thwaites, Ferguson.*

A large tree, with slender subglabrous branches. *Stipules*, bracts and bracteoles minute, caducous; leaflets 5–7, glabrous, subcoriaceous, conspicuously alternate, broad oblong, subacute, 2–3 in. long. *Flowers* in sparse axillary racemes and terminal corymbose panicles. *Calyx* pedicellate, glabrous, ½ in., leathery; teeth lanceolate. *Corolla* dark purple, yellowish at the base; keel-petals slightly cohering. *Pod* 3–5 in. by 1 in., 4–5 seeded, glabrous, polished.

95. **ORMOSIA,** Jacks.

Erect trees. *Leaves* odd-pinnate. *Flowers* usually in dense terminal racemes. *Calyx* campanulate, deeply 5-cleft, the upper teeth the shortest. *Corolla* not much exserted; petals all with short claws, about equal in length; standard round; keel-petals and wings oblong, obtuse, the former not connate. *Stamens* free, much incurved, often exserted when the flower expands; anthers oblong, versatile. *Ovary* subsessile; style long, filiform, circinate at the end, stigma oblique. *Pod* thick, rigid or rather fleshy, turgid, 2-valved, continuous within, the sutures not winged. *Seeds* with a bright scarlet aril or testa.—DISTRIB. Species above 20, cosmopolitan in the tropics.

* *Leaflets glabrous beneath. Seeds (where known) large.*

1. **O. robusta,** *Wight Ic.* t. 245 (Sophora in tab.); leaflets 7–11 oblong lanceolate dark green, racemes crowded in terminal panicles, pedicels shorter than the calyx, pod oblong with the valves round on the back. O. floribunda, *Wall. Cat.* 5337. Sophora robusta, *Roxb. Hort. Beng.* 31. Arillaria robusta, *Kurz in Journ. Asiat. Soc. Beng.* vol. xlii. pt. 2, 71.

SILHET, *Roxburgh, Wallich.* PEGU and TENASSERIM, *Kurz.*

A large tree, with thick sulcate thinly grey-downy branches. *Leaflets* opposite, 3–5 in. long, acute, rounded at the base, rigidly subcoriaceous, dull green beneath, the veins fine, rather raised. *Racemes* in a large end panicle and also from the axils of the upper leaves, the branches finely grey-downy; bracts lanceolate, minute, subpersistent; bracteoles 0. *Calyx* under ¼ in., brown-silky, the teeth as long as the tube. *Corolla* twice the length of the calyx. *Ovary* densely silky. *Pod* oblong, glabrous, bright yellow, rather fleshy, but two-valved, usually 1-seeded, 2–2½ in. long, sometimes 2-seeded. *Seeds* oblong, 1½ in. long, 'enveloped in a complete thick fleshy scarlet aril.'—*Kurz.*

2. **O. travancorica,** *Bedd. Fl. Sylv.* t. 45; leaflets 7–9 oblong dull green long-stalked, racemes crowded in terminal panicles, pedicels very short, pod oblong with the valves rounded on the back.

TRAVANCORE hills, *Beddome.*

A tall tree, with finely grey-downy branchlets. *Leaflets* opposite, oblong, cuspidate, rigidly coriaceous, 2–3 in. long, dull grey-green beneath, rounded at the base, slightly downy on the midrib, the veinlets immersed; petiolules $\frac{1}{4}$–$\frac{1}{3}$ in. long. *Flowers* crowded on the finely grey-downy branches; bracts very minute. *Calyx* brown-silky, $\frac{1}{6}$–$\frac{1}{5}$ in., deeply 5-cleft. *Corolla* whitish, under twice the length of the calyx. *Pod* glabrous, hard, oblique oblong, subacute, 3 in. long, 1-seeded. *Seed* oblong, 1 in. long, with a bright scarlet testa.

3. **O. macrodisca,** *Baker*; leaflets 7–9 rigidly coriaceous pale green oblong, short-stalked, racemes crowded in terminal panicles, pedicels shorter than the calyx, pod large orbicular with subcompressed thick valves.

MALACCA, *Maingay.*

A large tree, with very thick grey glabrous branchlets. *Leaflets* very thick and rigid in texture, pale grey-green on both surfaces, acute, broadly rounded at the base, 3–5 in. long, quite glabrous, the veins immersed. Branches of the *panicle* stout, sulcate, glabrous; bracts and bracteoles minute, subpersistent; pedicels brown-silky $\frac{1}{8}$–$\frac{1}{6}$ in. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in., densely brown-silky, cleft considerably below the middle. *Corolla* half as long again as the calyx; standard $\frac{3}{8}$ in. broad. *Stamens* considerably exserted. *Pod* hard, thick, 3 in. broad, flat at first, turgid when the usually solitary seed swells. *Seed* oblong, 1 in. long, with a large black adnate pitted aril.

4. **O. glauca,** *Wall. Pl. Asiat. Rar.* ii. 23, t. 125; leaflets 7–9 oblong dull pale green distinctly stalked, flowers in axillary racemes, pedicels as long as the calyx, pod unknown. *Wall. Cat.* 5338.

NIPAL, *Wallich.*

A tall tree, with thinly brown-velvety stout sulcate branchlets. *Leaflets* rigidly subcoriaceous, obtusely cuspidate, 3–4 in. long, dull pale green on both surfaces, the veins immersed; petiolules $\frac{1}{8}$–$\frac{1}{6}$ in. *Flowers* in peduncled racemes, shorter than the leaves; bracts and bracteoles minute, caducous. *Calyx* $\frac{1}{4}$ in., obscurely silky; teeth as long as the tube. *Corolla* white, twice the length of the calyx. *Ovary* linear, brown-silky, 3–4-ovuled.

** *Leaflets beneath and branchlets velvety. Seeds small.*

5. **O. microsperma,** *Baker*; leaflets 11–13 acute short-stalked, veinlets beneath slender raised anastomosing, pedicels shorter than the calyx, pod subcompressed with thin valves, seed oblong turgid.

MALACCA, *Griffith, Maingay.*

A middle-sized tree, with thick densely brown-velvety branches. *Leaflets* oblong, rigidly coriaceous, 2–4 in. long, grey-green, rather glossy above, broadly rounded at the base, densely persistently shortly pubescent beneath; petiolules $\frac{1}{12}$ in. *Branches* of the panicle rigidly erecto-patent, densely velvety. *Calyx* $\frac{1}{6}$–$\frac{1}{5}$ in., with a pair of small lanceolate bracteoles at the base, densely velvety; teeth as long as the tube. *Corolla* twice as long as the calyx. *Ovary* densely silky, 3–4-ovuled. *Pod* orbicular if 1-seeded, $\frac{1}{2}$–$\frac{5}{8}$ in. long, oblong if 2-seeded, lineate between the seeds, the valves thin, rigid, glabrescent. *Seeds* bright scarlet, $\frac{1}{4}$ in. long, exarillate.—Closely resembles *O. coarctata*, Jacks. in Trans. Linn. Soc. x. t. 25, from Guiana, and nearly allied to the Malayan *Macrotropis sumatrana*, Miq. Fl. Ind. Bat. Suppl. 294. Kurz refers here *Chaenolobium septemjugum* and *decemjugum*, Miq. Fl. Ind. Bat. Suppl. 302.

6. **O. parvifolia,** *Baker*; leaflets 9–13 small acute, long-stalked, veins

beneath inconspicuous, pedicels very short, pod subcompressed with thin valves, seeds oblong turgid. Macrotropis bancana, *Miq. Fl. Ind. Bat. Suppl.* 295?

MALACCA, *Griffith, Maingay.*

Branches slender, persistently brown-velvety. *Leaflets* rigidly coriaceous, grey-green, oblong, distinctly cuspidate, the end one 2–2½ in. long, rather glossy above, thinly hairy beneath, the veins fine and scarcely at all raised; petiolules ⅛–⅙ in. *Racemes* short; flowers crowded; bracts and bracteoles distinct, ovate-lanceolate, subpersistent. *Calyx* ⅙ in., brown-silky, cleft half way down. *Corolla* twice the length of the calyx. *Ovary* silky. *Pod* and seeds just like those of *O. microsperma.*

7. **O. venosa,** *Baker*; leaflets 7 obtuse or subobtuse nearly sessile on the rachis with thick much-raised parallel main veins beneath, pedicels long, pod-valves thick turgid, seeds orbicular subdiscoid.

MALACCA, *Maingay.*

A tall tree, with branches clothed with persistent dense velvety pubescence. *Leaflets* obovate-oblong, rigidly coriaceous, 3–4 in. long, grey-green and glabrous above, densely persistently tomentose beneath. *Flowers* crowded in terminal racemes, the branches densely velvety, not rigid as in the two preceding; bracts and bracteoles minute, but distinct and subpersistent; pedicels as long as the calyx. *Calyx* ¼ in., densely velvety, cleft down to the middle. *Corolla* half as long again as the calyx. *Stamens* distinctly exserted. *Pod* obtuse or subacute, oblong or obovoid-oblong, glabrous, 1½–1¾ in. long, 1 in. thick. *Seeds* bright scarlet, exarillate, ⅜–½ in. broad.

96. CÆSALPINIA, Linn.

Robust erect trees, shrubs or woody prickly climbers. *Leaves* large, abruptly bipinnate. *Flowers* showy, yellow, in copious axillary racemes. *Calyx* deeply-cleft, with the disk confined to its base, the lobes imbricated, the lowest the largest, cucullate. *Petals* spreading, usually orbicular with a distinct claw, the uppermost smaller than the others. *Stamens* 10, free, declinate; anthers oblong, uniform, versatile. *Ovary* sessile or subsessile, few-ovuled; style filiform, sometimes clubbed at the tip, stigma terminal. *Pod* oblong or ligulate, thin and flat, or thicker and subturgid, indehiscent or dehiscent, smooth or in subgen. *Guilandina* armed all over with wiry spines.—DISTRIB. Species about 40, widely spread in the tropics of both hemispheres.

SUBGEN. 1. **Guilandina** (Linn.) *Pod* dry, armed on the faces with abundant wiry prickles. *Petals* narrow.

1. **C. Bonducella,** *Fleming in Asiat. Res.* xi. 159; leaves stipulate, leaflets small, bracts squarrose. *Roxb. Fl. Ind.* ii. 357. Guilandina Bonducella, *Linn.*; *Wall. Cat.* 5803. G. Bonduc, *W. & A. Prodr.* 280; *Dalz. & Gibs. Bomb. Fl.* 79, *in part.*

From the HIMALAYAS, throughout India, ascending to 2500 ft. in KUMAON.—DISTRIB. Cosmopolitan in the tropics.

Branches finely grey-downy, with abundant small hard falcate yellow prickles. *Leaves* a foot or more long, with a pair of reduced pinnæ persistent at the base; pinnæ mostly 12–16; leaflets oblong, obtuse, mucronate, membranous, usually ½–1 in. long, rather downy beneath. *Racemes* long-peduncled, simple or panicled, dense at the top, lax downwards; pedicels as long as the calyx, finely brown-downy. *Calyx* ¼–⅓ in. *Petals* oblanceolate, yellow, little exserted. *Pod* short-stalked, oblong, 2–3 in. long. *Seeds* 1–2, large, oblong, lead-coloured.

2. **C. Bonduc,** *Roxb. Hort. Beng.* 32; *Fl. Ind.* ii. 362; leaves without stipules, leaflets larger, bracts ascending. Guilandina Bonduc, *Linn.*; *DC. Prodr.* ii. 480; *Wall. Cat.* 5806; *W. & A. Prodr.* 280, *ex parte.* G. glabra, *Mill. Dict.* No. 3.

EASTERN and WESTERN PENINSULAS. CEYLON.—DISTRIB. Malay isles, Polynesia, West Indies.

Very near *C. Bonducella*, from which it differs by its more robust habit, less downy branches, larger leaflets (often 2–3 in. long), the absence of the reduced stipular pinnæ, by its smaller not squarrose bracts, and more tropical dispersion.

SUBGEN. 2. **Eucæsalpinia.** *Pod* dry, naked on the valves, indehiscent or finally dehiscing, the sutures thin except in *C. sepiaria*. *Petals* broad.

3. **C. Nuga,** *Ait. Hort. Kew,* iii. 32; glabrous, pinnæ 4–6, leaflets 4–6 large ovate, stamens little exserted, pod woody broad-oblong 1-seeded. Guilandina Nuga, *Linn. Sp. Pl.* 546. C. paniculata, *Roxb. Hort. Beng.* 32; *Fl. Ind.* ii. 364; *DC. Prodr.* ii. 481; *W. & A. Prodr.* 281; *Wight Ic.* t. 36; *Dalz. & Gibs. Bomb. Fl.* 79. C. sumatrana, *Wall. Cat.* 5831 B, C, *non Roxb.* C. bijuga, *Wall. Cat.* 5833, *non Sw.* C. scandens, *Kœnig*; *DC. Prodr.* ii. 482; *Wall. Cat.* 5829.

CHITTAGONG, SILHET, EASTERN and WESTERN PENINSULAS, and CEYLON.—DISTRIB. Malay isles, Philippines, China, N. Australia, Polynesia.

Branches slender, very flexuose. *Prickles* copious, dark-coloured, hooked. *Leaflets* distinctly petioluled, $1\frac{1}{2}$–2 in. long, obtuse, glossy. *Racemes* axillary and terminal, copiously panicled, with spreading branches; pedicels as long as the calyx. *Calyx* glabrous, $\frac{1}{4}$–$\frac{1}{3}$ in. *Petals* scarcely exserted. *Filaments* densely woolly in the lower half. *Pod* 2 in. long, broad, oblong, beaked, hard, glabrous, indehiscent, rather turgid.

4. **C. Sappan,** *Linn.*; *DC. Prodr.* ii. 482; subglabrous, pinnæ 20–24, leaflets 20–30 moderately small oblong very oblique, stamens little exserted, pod oblique oblong woody 3–4-seeded. *Roxb. Cor. Pl.* i. 17, t. 16; *Hort. Beng.* 32; *Fl. Ind.* ii. 357; *Wall. Cat.* 5838; *W. & A. Prodr.* 281; *Bedd. Fl. Sylv.* 90; *Anal. Gen.* t. xiii. fig. 1. Biancæa Sappan, *Todaro Hort. Bot. Panorm.* 3.

EASTERN and WESTERN PENINSULAS and PEGU.—DISTRIB. Malay isles.

A small tree. *Prickles* small and few. *Leaf*-rachis $\frac{1}{2}$–1 ft. long; leaflets close, sessile, subcoriaceous, $\frac{1}{2}$–$\frac{3}{4}$ in. long, attached at the lowest corner. *Panicles* often as long as the leaves, the young branches slightly ferrugineo-pubescent; bracts large, lanceolate, caducous; pedicels $\frac{1}{2}$–$\frac{5}{8}$ in. *Calyx* $\frac{3}{8}$ in., glabrous. *Filaments* densely woolly in the lower half. *Ovary* grey-velvety. *Pod* 3–4 in. by $1\frac{1}{2}$ in., subcompressed, polished, indehiscent, with a hard recurved beak at the upper angle.

5. **C. pulcherrima,** *Swartz, Obs.* 166; glabrous, pinnæ 12–18, leaflets 20–24 small oblique-oblong, stamens much exserted, pod thin ligulate flat glabrous 6–8-seeded. Poinciana pulcherrima, *Linn.*; *Bot. Mag.* t. 995; *Roxb. Fl. Ind.* ii. 355; *DC. Prodr.* ii. 484; *Wall. Cat.* 5813; *W. & A. Prodr.* 282.—*Rheede Hort. Mal.* vi. t. 1.

Universally cultivated through India and elsewhere in the tropics; the native country not clearly known.

A shrub or small tree. *Prickles* few and scattered on the branches. *Leaflets* sessile, close, membranous, $\frac{1}{2}$–$\frac{3}{4}$ in. long, not so oblique as in the last, very obtuse. *Racemes* very broad, the lower pedicels 3–4 in. long. *Calyx* $\frac{1}{2}$–$\frac{5}{8}$ in., glabrous. *Petals* round, crisped, reddish-yellow, with a very distinct claw, the largest and most showy of all the species. *Filaments* bright red, 3–4 times the length of the corolla. *Pod* nearly straight, 2–3 in. long, the narrowest and thinnest of that of any of the species.

6. **C. sepiaria,** *Roxb. Hort. Beng.* 32; *Fl. Ind.* ii. 360; downy, pinnæ 12–20, leaflets 16–24 small oblong, stamens little exserted, pod oblong-ligulate subturgid veined 4–8-seeded. *Wall. Cat.* 5834, *excl. H.*; *W. & A. Prodr.* 282; *Wight Ic.* t. 37; *Dalz. & Gibs. Bomb. Fl.* 80. C. ferox, *Hassk. Pl. Jav. Rar.* 400. C. japonica, *Sieb. & Zucc. Fl. Jap.* 9. C. crista, *Thunb. Fl. Jap.* 179, *non Linn.* Reichardia decapetala, *Roth*; *DC. Prodr.* ii. 484. Biancæa scandens, *Todaro Hort. Bot. Panorm.* 4, t. 1.

HIMALAYAS to CEYLON and AVA, ascending to 4000 ft. in the North-West.—DISTRIB. Malay isles, China, Japan and introduced in Tropical America.

Branches more or less densely coated with grey or brown pubescence. *Prickles* small, copious, hooked, pale brown. *Leaves* ¾–1 ft. long; pinnæ distinctly stalked; leaflets membranous, very obtuse, ½–1 in. long, green and glabrous above, glaucous and slightly pubescent beneath. *Racemes* simple, distinctly-peduncled, ½–1 ft. long; pedicels rigidly erecto-patent, twice the length of the calyx. *Calyx* ⅜–½ in., more or less pubescent. *Corolla* ½ in., bright yellow. *Filaments* densely woolly in the lower half. *Pod* 3–5 in. by above 1 in., sublignose, glabrous, rather recurved, with the upper suture dilated into a narrow *Derris*-like wing, subindehiscent.

7. **C. mimosoides,** *Lam. Ill.* t. 335, fig. 2; downy, pinnæ 20–60, leaflets 20–40 oblong very small, stamens little exserted, pod recurved oblong very turgid 2-seeded. *DC. Prodr.* ii. 482; *W. & A. Prodr.* 281; *Wight. Ic.* t. 392; *Dalz. & Gibs. Bomb. Fl.* 80. C. Simora, *Ham. in Roxb. Hort. Beng.* 32; *Fl. Ind.* ii. 359. C. resupinata, *Roxb. Hort. Beng.* 32; *Fl. Ind.* ii. 362. C. horrida, *Wall. Cat.* 5836. C. armata, *Grah. in Wall. Cat.* 5840. Biancæa mimosoides, *Todaro Hort. Bot. Panorm.* 3.

BIRMA at Chappedong, *Wallich.* WESTERN PENINSULA. CEYLON.

Branches armed with copious irregular small prickles, passing down gradually into aciculi, bristles and hairs. *Leaves* 1–1½ ft. long, much narrower than in the other species; leaflets sessile, membranous, sensitive, glabrous, ¼–⅜ in. long. *Racemes* lax, simple, 1–2 ft. long, the rachis densely prickly and like the rigidly erecto-patent prickles very rough with hard raised points; pedicels 2–3 times the length of the calyx. *Calyx* ¼–⅜ in., more or less downy. *Petals* broad, bright yellow, scarcely exserted. *Filaments* densely woolly in the lower half. *Pod* under 2 in. long, more turgid than in the other species, half an inch thick, narrowed to the base, hard, subindehiscent, clothed with minute deciduous bristles, truncate at the end with a short recurved beak, the sutures not at all thickened.

SUBGEN. 3. **Cinclidocarpus** (Z. & M.). *Pod* rather fleshy, indehiscent, naked on the faces, the sutures much thickened. *Petals* broad.

8. **C. digyna,** *Rottl.*; *DC. Prodr.* ii. 482; leaflets 16–20 membranous, pedicels spreading 2–4 times the length of the calyx. *Wall. Cat.* 5839; *W. & A. Prodr.* 281. C. oleosperma, *Roxb. Hort. Beng.* 32; *Fl. Ind.* ii. 356. C. flavicans, *Grah. in Wall. Cat.* 5825. C. gracilis, *Miq. Flor. Ind. Bat.* i. 110. Pterolobium lacerans, *Wall. Cat.* 5841, F. & I.

EASTERN HIMALAYAS, EASTERN and WESTERN PENINSULAS, and CEYLON.—DISTRIB. Malay isles.

Branches glabrous or slightly downy; prickles scattered, uniform. *Leaves* ½–¾ ft. long; leaflets close, oblong, obtuse, sessile, ¼–½ in. long, dark green and glabrous above, grey and glabrescent or obscurely downy beneath. *Racemes* peduncled, simple, equalling or exceeding the leaves; pedicels ½–1 in., slender, glabrous, spreading horizontally or rather deflexed. *Calyx* glabrous, ¼–⅓ in. *Stamens* little exserted, woolly. *Pod* oblong, glabrous, 1½–2 in. long, 2–4-seeded, turgid, torulose.

9. **C. cinclidocarpa,** *Miq. Flor. Ind. Bat.* i. 110; leaflets 28–36 rigidly subcoriaceous, racemes copiously panicled, pedicels erecto-patent as long as the

calyx. Cinclidocarpus nitidus, *Zoll. & Moritz. Nat. Geneesk.* iii. 74. C. microphylla, *Hamilt. in Wall. Cat.* 5826. C. tortuosa, *Wall. Cat.* 5827 D.

ASSAM and SILHET.—DISTRIB. Java.

Obscurely downy. *Prickles* scattered, uniform. *Leaves* a foot or more long; pinnæ 20–24; leaflets close, sessile, obtuse, ligulate, caducous, $\frac{1}{2}$–$\frac{3}{4}$ in. by $\frac{1}{8}$–$\frac{1}{6}$ in., glossy above. *Panicles* often as long as the leaves, with finely downy rachises and pedicels. *Calyx* $\frac{3}{8}$–$\frac{1}{2}$ in. *Petals* round with a claw, bright yellow. *Stamens* little exserted. *Pod* oblong, indehiscent, 2–3 in. by 1 in., glabrous, 3–4-seeded.

10. **C. tortuosa,** *Roxb. Hort. Beng.* 32; *Fl. Ind.* ii. 365; leaflets 40–60 rigidly subcoriaceous, racemes simple, pedicels erecto-patent as long as the calyx. *Wall. Cat.* 5827 A, B, C.

TENASSERIM, *Wallich.*—DISTRIB. Malay isles.

Branches slightly downy. *Prickles* small, scattered, uniform. *Leaves* 1–1$\frac{1}{2}$ ft. long; pinnæ 30–40; leaflets close, glossy, sessile, narrow ligulate, obtuse, $\frac{1}{4}$–$\frac{1}{3}$ in. by $\frac{1}{12}$ in., just like those of the last in shape and texture. *Racemes* as long as the leaves. *Calyx* $\frac{3}{8}$ in., glabrous. *Pod* just like those of the two preceding.

97. PELTOPHORUM, *Vogel.*

Tall unarmed trees. *Leaves* abruptly bipinnate. *Flowers* showy, yellow, in axillary and panicled terminal racemes. *Calyx* with the disk confined to the base; teeth subequal, very deep, imbricate. *Petals* oblong or roundish, imbricated, spreading. *Stamens* 10, free, declinate; filaments with a dense tuft of hairs at the base; anthers uniform, linear-oblong. *Ovary* sessile, free, few-ovuled; style long, filiform, incurved, stigma large peltate. *Pod* oblong, flat, thin, hard, indehiscent, with a firm broad wing on each suture.—DISTRIB. Species 6, cosmopolitan in the Tropics.

1. **P. ferrugineum,** *Benth. Fl. Austral.* ii. 279; flowering pedicels at most as long as the calyx. Cæsalpinia ferruginea, *Miq. Flor. Ind. Bat.* i. 111. C. arborea, *Miq. loc. cit.* 112. C. Glenniei, *Thwaites Enum.* 414. C. inermis, *Roxb. Fl. Ind.* ii. 367. Poinciana Roxburghii, *G. Don Gen. Syst.* ii. 433.

SINGAPORE, MALACCA, ANDAMANS, and CEYLON.—DISTRIB. Malay isles, N. Australia.

Young branches clothed with thin bright reddish-brown tomentum. *Leaves* distinctly petioled, $\frac{1}{2}$–1 ft. long; pinnæ opposite, 16–20, $\frac{1}{4}$–$\frac{1}{2}$ ft. long; leaflets 20–30, close, ligulate-oblong, sessile, obtuse, unequal-sided, $\frac{1}{2}$–$\frac{3}{4}$ in. long, rigidly subcoriaceous, slightly tomentose below. *Branches* of the panicle numerous, stiffly erecto-patent, conspicuously ferrugineo-tomentose, as is also the calyx; bracts minute, lanceolate, caducous. *Calyx* $\frac{1}{4}$ in. deep. *Pod* 1–4-seeded, rigid, glabrous, 2–4 in. by 1 in., narrowed to both ends, closely longitudinally veined.

2. **P. dasyrachis,** *Kurz MSS.*; flowering pedicels 3–4 times as long as the calyx. Cæsalpinia dasyrachis, *Miq. Flor. Ind. Bat. Suppl.* 292. C. Finlaysoniana, *Grah. in Wall. Cat.* 5971.

MALACCA, *Griffith, Maingay.*—DISTRIB. Java, Sumatra.

Very near *P. ferrugineum*, with which it agrees in vestiture and leaves. *Flower-racemes* 6–9 in. by 3 in.; lower pedicels patent or rather reflexed, 1–1$\frac{1}{4}$ in. long; bracts linear, subpersistent, $\frac{1}{2}$ in. long. *Flowers* rather larger. *Pod* the same shape but rather larger, thinner and not reticulately veined.

98. MEZONEURUM, *Desf.*

Robust woody prickly climbers. *Leaves* abruptly bipinnate. *Flowers* in ample panicled racemes. *Calyx* very oblique, usually deeply cleft, with the disk

confined to the base or extending upwards, the lobes imbricated, the lowest the longest, remarkably hood-like. *Petals* spreading, obovate-spathulate, subequal. *Stamens* free, declinate, usually exserted; anthers oblong, uniform. *Ovary* sessile, many-ovuled; style filiform, incurved with the stamens, stigma small capitate. *Pod* large, oblong, flat, thin, indehiscent, with a broad wing down the upper suture.—DISTRIB. Species 10, mostly Trop. Asiatic, confined to the old world.

* **Eumezoneuron.** *Calyx* deeply cleft; disk basal.

1. **M. cucullatum,** *W. & A. Prodr.* 283; leaflets 8-10 large ovate acute glabrous, stamens much exceeding the calyx. *Dalz. & Gibs. Bomb Fl.* 80. Cæsalpinia cucullata, *Roxb. Hort. Beng.* 32; *Fl. Ind.* ii. 358; *G. Don Gen. Syst.* ii. 431; *Wall. Cat.* 5828, *excl.* B. M. macrophyllum, *Blume*; *Miq. Flor. Ind. Bat.* i. 104.

EASTERN HIMALAYAS from NIPAL, ascending to 4,000 ft. to the KHASIA hills, BEHAR and the WESTERN PENINSULA.—DISTRIB. Malay isles.

Branches glabrous, with small dark hooked scattered prickles. *Leaf*-rachis ½-1 ft. long; pinnæ 4-10 long-stalked; leaflets rigidly subcoriaceous, 1-2 in. long, glabrous, dark-green above, subdistant, rather glaucous below. *Racemes* simple or forked, sometimes as long as the leaves, the rachis virgate, tinged with yellow; pedicels as long as the calyx, which is the most oblique of all the species, with the posterior sepal and petal very cucullate. *Calyx* ⅜ in., glabrous, tinged with yellow. *Petals* bright yellow, streaked with red. *Filaments* faintly ciliated near the base. *Pod* like that of a *Dalbergia*, with a single large seed in the middle, 3-4 in. long, with a wing like the valves in texture ¼-⅜ in. broad.

VAR. *grandis*, Heyne in Wall. Cat. 5830, under Cæsalpinia, sp.; larger in all its parts, the leaflets 3-4 in. long, and wing of the pod ½ in. broad. Guilandina macrocarpa, *Grah. in Wall. Cat.* 5804.—Distribution of the type.

Rheede Hort. Mal. vol. vi. t. 20, on which is founded Guilandina axillaris, Lam. (Cæsalpinia? axillaris, DC. Prodr. ii. 481) is probably made up of the leaf of this and pod of *Cæsalpinia Sappan.*

2. **M. glabrum,** *Desf. in Mem. Mus.* iv. 246, t. 10; leaflets 14-16 small glabrous oblong obtuse distinctly stalked, stamens much exceeding the calyx. *DC. Prodr.* ii. 484. Cæsalpinia furfuracea, *Wall. Cat.* 5835.

TENASSERIM, *Wallich.*—DISTRIB. Philippines, Timor.

Branches glabrous, the falcate prickles almost restricted to the base of the pinnæ. *Leaves* 1 ft. long; pinnæ 12-14, distinctly stalked; leaflets membranous, caducous, close, dark green, alternate, ½-¾ in. long. *Racemes* simple or forked, as long as the leaves: pedicels exceeding the calyx. *Calyx* glabrous, ½ in. long, less oblique than in the last, the upper teeth reaching half down, the lowest twice as long. *Filaments* densely ciliated near the base. *Pod* 5-6 in. by 1¼ in., 2-4-seeded, with a wing ½-⅝ in. broad.

3. **M. enneaphyllum,** *W. & A. Prodr.* 283; leaflets 18-22 small glabrous oblong obtuse subsessile, stamens slightly exceeding the calyx. Cæsalpinia enneaphylla, *Roxb. Hort. Beng.* 32; *Fl. Ind.* ii. 363; *Miq. Flor. Ind. Bat.* i. 104, tab. 2 B. C. sepiaria, *Wall. Cat.* 5834 H.

CACHAR and CHITTAGONG, *Hook. fil. and Thomson.* TAVOY, *Gomez.* PEGU, *McClelland.* CEYLON, *Thwaites.*—DISTRIB. Malay isles.

Branches slender, glabrous; prickles copious, minute, falcate. *Leaves* ¾-1 ft. long; pinnæ 16-20, distinctly stalked, 2-3 in. long; leaflets sensitive, glabrous, membranous, ⅜-½ in. long. *Racemes* copiously panicled, sometimes a foot long; pedicels slender, glabrous or pubescent, twice as long as the calyx. *Flower* smaller than in the last. *Calyx* ¼-⅓ in., glabrous. *Corolla* bright yellow. *Filaments* densely woolly at the base. *Pod* 3-4 in. long by less than 1 in., thin and glossy, 4-6-seeded; wing ¼-⅜ in. broad.—Very like *Cæsalpinia sepiaria* in habit and inflorescence.

4. **M. pubescens,** *Desf. in Mem. Mus.* iv. 246, t. 11; leaflets 12–16 small oblong obtuse pubescent subsessile, stamens slightly exceeding the calyx. Cæsalpinia hymenocarpa, *Wall. Cat.* 5832.

AVA; Taong-dong, *Wallich.* CEYLON, *Thwaites.*—DISTRIB. Malay isles.

General habit and inflorescence of the last. *Branches,* leaves below and calyx densely finely grey-downy. *Pinnæ* 12–24, distinctly stalked; leaflets sensitive, $\frac{1}{2}$–$\frac{5}{8}$ in. long. *Racemes* close, copiously panicled; pedicels erecto-patent, twice the calyx. *Flowers* larger than in the last, bright yellow. *Filaments* densely woolly near the base. *Pod* 3–4-seeded, 3–4 in. by 1 in. broad, without the wing.

** **Tubicalyx,** *Miq. Flor. Ind. Bat.* i. 1081. *Calyx* shallowly cleft with the disk extending above the base.

5. **M. sumatranum,** *W. & A. Prodr.* 283. Cæsalpinia sumatrana, *Roxb. Hort. Beng.* 32; *Fl. Ind.* ii. 366; *Wall. Cat.* 5831, A, *not* B and C.

MALACCA, *Griffith, Maingay.*—DISTRIB. Malay isles.

Branches thick, rather downy, armed with copious small falcate prickles. *Leaves* a foot or more long; pinnæ and leaflets both 8–10, the latter obovate-oblong, rigidly coriaceous, glabrous, obtuse, 2–3 in. long. *Racemes* as long as the leaves, forked; rachis virgate, woody; pedicels very short. *Calyx* glabrous, $\frac{3}{8}$–$\frac{1}{2}$ in. long, the upper teeth not more than $\frac{1}{12}$ in. deep, the lowest rather longer, the tube splitting off at the insertion of the glabrous filaments. *Petals* little exserted, reddish-yellow, much narrower than in the other species, permanently imbricated, oblanceolate-spathulate. *Pod* thin, 3–4 in. by 1 in., 3–4-seeded, with a moderately broad wing.—The structure of the flower is so different from that of the other species that it would probably be better to separate it generically, and place it next to *Wagatea.*

99. PTEROLOBIUM, R. Br.

Woody climbers, with the habit of *Cæsalpinia,* from which they differ only in pod. *Calyx* deeply cleft, with the disk near the base, the lobes imbricated, the lowest longer and more hooded than the others. *Petals* spreading, oblong and clawed, equalling the calyx. *Stamens* 10, free, declinate, little exserted; anthers oblong, versatile. *Ovary* sessile, 1-ovuled; style filiform, stigma small terminal. *Pod* indehiscent, samaroid, with a large horny oblique terminal wing.—DISTRIB. Species 4, spread through the Tropics of the old world.

1. **P. indicum,** *A. Rich. Fl. Abyss.* i. 246. Cæsalpinia lacerans, *Roxb. Fl. Ind.* ii. 367. Pterolobium lacerans, *Wall. Cat.* 5841, A to E; *W. & A. Prodr.* 283; *Wt. Icones,* t. 196; *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2 71 *non R. Br.* Reichardia hexapetala, *Roth*; *DC. Prodr.* ii. 484.

WESTERN PENINSULA.

Branches slender, finely downy; prickles minute, hooked, uniform. *Pinnæ* 8–16; leaflets 12–16, close, sessile, oblong, obtuse, membranous, sensitive, $\frac{1}{3}$ in. long, glabrous, pale green. *Racemes* 2–3 in. long, copiously panicled at the end of the branches; pedicels finely downy, spreading, $\frac{3}{8}$–$\frac{1}{2}$ in. *Calyx* glabrous, $\frac{1}{6}$–$\frac{1}{5}$ in.; lowest sepal longest. *Corolla* yellow, not showy, as long as the lowest sepal. *Pod* $1\frac{1}{4}$–$1\frac{1}{2}$ in.; wing $\frac{3}{4}$–1 in. by $\frac{3}{8}$–$\frac{5}{8}$ in.

VAR. 1. *microphyllum,* Miq.; Kurz, loc. cit. sp.; racemes copiously panicled, leaflets [illegible] in. long, pod 2 in. long with an obtuse or obliquely acute wing $1\frac{1}{4}$–$1\frac{1}{2}$ in. by $\frac{1}{2}$ in.—Tenasserim, *Helfer.* Malacca, *Maingay.*—DISTRIB. Malay isles.

VAR. 2. *macropterum,* Kurz, loc. cit. sp.; branches stouter, leaflets much larger, pod $2\frac{1}{2}$–$2\frac{3}{4}$ in. long with an obtuse wing $1\frac{1}{2}$–2 in. by $\frac{3}{4}$–$\frac{7}{8}$ in.—Pegu, Martaban, Tenasserim.

100. **POINCIANA,** Linn.

Erect unarmed trees. *Leaves* just those of *Cæsalpinia.* *Flowers* in corymbose racemes. *Calyx* deeply cleft, with the disk a little above the base, the segments valvate, oblanceolate, subequal. *Petals* spreading, subequal, orbicular, with a claw, the blade crispato-fimbriate. *Stamens* 10, free, declinate, much exserted; anthers oblong, versatile. *Ovary* subsessile, many-ovuled; style very long, filiform, stigma minute capitate. *Pod* flat, thin, dehiscent, ligulate, continuous within, the sutures neither thickened nor winged.—DISTRIB. Species 2–3, Trop. African and Asiatic.

1. **P. elata,** *Linn.*; *DC. Prodr.* ii. 484; *Roxb. Fl. Ind.* ii. 355; *Wall. Cat.* 5812; *W. & A. Prodr.* 282; *Bedd. Fl. Sylv.* t. 178; Cæsalpinia elata, *Swartz Obs.* 166.

Truly wild in the WESTERN PENINSULA, planted elsewhere.—DISTRIB. Arabia, W. Trop. Africa.

An erect tree, 20–30 ft. high. *Leaves* $\frac{1}{2}$–$\frac{3}{4}$ ft. long; pinnæ 10–16; leaflets 30–40, membranous, caducous, close, sessile, obtuse, ligulate. *Flowers* in corymbose racemes; pedicels and obovoid buds finely grey-downy. *Calyx* very coriaceous, $\frac{3}{4}$–1 in. long. *Petals* scarcely exserted, an inch broad, shortly clawed. *Filaments* bright red, 3–4 times the length of the calyx, downy near the base. *Pod* 6–8 in. long by above an inch, 4–8-seeded.—The Mascarene P. REGIA, *Bojer,* with petals much exceeding the calyx, is frequently planted in India.

101. **PARKINSONIA,** Linn.

Trees. *Leaves* with 2–6 pinnæ from a very short rachis. *Flowers* yellow, in short racemes. *Calyx* deeply cleft, with a subbasal disk, the divisions subvalvate, lanceolate, subequal. *Petals* exserted, broad, the upper with a long claw. *Stamens* 10, included, villose; anthers versatile. *Ovary* short-stalked, many-ovuled; style filiform, stigma terminal. *Pod* turgid, dry, moniliform, finally dehiscing.—DISTRIB. Species 3, of which 2 are American, the other Cape.

1. **P. aculeata,** *Linn.*; *DC. Prodr.* ii. 486; *Roxb. Hort. Beng.* 31; *W. & A. Prodr.* 284; *Bedd. Fl. Sylv.* 91; *Anal. Gen.* t. 13, fig. 2.

Universally cultivated and often naturalised. A native of Tropical America.

A glabrous bush or low tree, armed with sharp woody spines, which represent the primary rachis of a bipinnate leaf and have 2–6 pinnæ congested in their axils. *Pinnæ* $\frac{1}{2}$–1 ft. long, the rachis much flattened, so that when the very minute obtuse oblanceolate leaflets have fallen or are not developed they resemble the phyllodes of an acacia. *Racemes* lax, shorter than the leaves; pedicels long, slender, erecto-patent. *Corolla* tender, yellow, $\frac{3}{8}$–$\frac{1}{2}$ in. *Pod* 3–4 in. long.

102. **WAGATEA,** Dalz.

A climbing shrub. *Leaves* abruptly bipinnate. *Flowers* in long simple or panicled spikes. *Calyx* cleft about half way down into 5 obtuse teeth, the lowest the longest and wrapt over the others, the disk high up in the tube. *Petals* oblanceolate, obtuse, subequal, little exserted. *Stamens* 10, included, nearly straight, filaments naked; anthers oblong. *Ovary* sessile, many-ovuled; style slightly clubbed at the tip, stigma oblique. *Pod* ligulate-oblong, indehiscent, few-seeded, subtorulose, with thickened sutures, not winged. — DISTRIB. Endemic.

1. **W. spicata,** *Dalz. in Kew Journ.* iii. 90; *Wight Ic.* t. 1995; *Dalz. & Gibs. Bomb. Fl.* 80. Cæsalpinia mimosoides, *Heyne in Wall. Cat.* 5837, *non Lam.* C. ferox, *Hohen. Pl. Ind. Or. Exs.* No. 414, *non Hassk.*

Hills of WESTERN PENINSULA.

A robust woody prickly climber. *Leaves* ¾–1 ft. long and broad; pinnæ 8–12; leaflets 12–14, nearly sessile, oblong, obtuse, or subacute, 1–2 in. long, rigidly subcoriaceous, glabrous, venulose. *Flowers* in long simple or panicled dense subspicate racemes with a thick furrowed woody finely brown-downy axis; bracts minute, lanceolate-cuspidate. *Calyx* ⅜ in., scarlet. *Petals* orange. *Pod* like that of *Cæsalpinia digyna.*

GLEDITSCHIA SINENSIS, *Linn.*; *Wall. Cat.* 5811, is known in India in cultivation only.

103. CASSIA, Linn.

Erect shrubs or trees, rarely herbs. *Leaves* simple, abruptly pinnate. *Flowers* usually large and showy, in axillary racemes and terminal panicles. *Calyx-tube* very short; sepals broad or narrow, imbricated. *Petals* 5, imbricated, subequal, usually broad. *Stamens* normally 10, but rarely all perfect, 3–5 being often reduced to staminodia or altogether absent; anthers mostly but not invariably basifixed, dehiscing by terminal pores or with the slit more or less continued longitudinally. *Ovary* sessile or stalked, many-ovuled; style incurved, stigma terminal. *Pod* very variable, terete or flat, usually septate, the albuminous seeds flattened, sometimes parallel with the valves, sometimes with the septa, dry, dehiscent or indehiscent.—DISTRIB. Species 340, spread everywhere in the tropics, a few extra-tropical. Monographed by Mr. Bentham in Trans. Linn. Soc. xxvii. p. 503, t. 60–3.

SUBGEN. 1. **Fistula,** *DC.* (Cassia, *Roxb.*) *Sepals* obtuse. *Stamens* all bearing anthers, of which those of the 2–3 lowest are larger than the others and the filaments longer. *Pods* very large, terete. *Seeds* compressed parallel with the dissepiments.—Trees.

1. **C. Fistula,** *Linn.*; *DC. Prodr.* ii. 490; leaflets 8–16 large narrowed to the point, flowers in long lax racemes, bracts caducous, petals veined bright yellow. *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 333; *Wall. Cat.* 5302; *W. & A. Prodr.* 285; *Dalz. & Gibs. Bomb. Fl.* 80; *Bedd. Fl. Sylv.* 91. C. rhombifolia, *Roxb. Hort. Beng.* 31; *Fl. Ind.* iii. 334; *Wight. Ic.* t. 269.

CENTRAL and EASTERN HIMALAYAS to CEYLON and MALACCA, ascending to 3000 ft. in KUMAON, wild and often planted.—DISTRIB. China, Malay isles.

A middle-sized erect tree, glabrous in all its parts. *Leaves* a foot or more long; leaflets 2–6 in. long, ovate, distinctly stalked, usually acute, rigidly subcoriaceous, pale green, strongly veined. *Racemes* as long as the leaves; pedicels spreading, 1½–2 in. long. *Calyx* ¼–⅓ in., glabrous, caducous. *Petals* obovate, shortly clawed, ¾–1 in. deep. *Pod* 1–2 ft. long, above an inch thick.

2. **C. nodosa,** *Ham.*; *Roxb. Hort. Beng.* 31; *Fl. Ind.* iii. 336; branches slightly downy, leaflets 12–24 moderately large pointed, racemes short corymbose, bracts persistent, petals moderately large reddish not veined. *Wall. Cat.* 5331; *Wight Ic.* t. 410.

EASTERN HIMALAYAS and to MALACCA.—DISTRIB. Malay isles, Philippines.

A tree, reaching a height of 50 feet. *Leaves* a foot or more long; leaflets oblong, acute, distinctly stalked, 2–4 in. long, rather oblique at the base, glossy, subcoriaceous, strongly veined, with a few obscure short hairs below. *Racemes* from the old

branches, dense, under half a foot long; bracts silky, lanceolate, persistent; pedicels twice the length of the flower, lower deflexed. *Sepals* downy, $\frac{1}{4}$–$\frac{1}{3}$ in. *Petals* oblong, acute, $\frac{3}{4}$–1 in. deep. *Pod* a ft. long, $\frac{1}{2}$ in. thick.

3. **C. marginata,** *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 338; branchlets densely tomentose, leaflets 30–40 small obtuse, racemes short subcorymbose, bracts persistent, petals small reddish not veined. C. Roxburghii, *DC. Prodr.* ii. 489; *Wall. Cat.* 5308; *W. & A. Prodr.* 286; *Bedd. Fl. Sylv.* t. 180; *Wight Illust.* t. 83.

CEYLON and WESTERN PENINSULA.

Branches slender, sulcate. *Leaves* $\frac{1}{2}$–1 ft. long; leaflets oblong, deeply emarginate, with a distinct mucro, 1–1$\frac{1}{2}$ in. long, rigidly subcoriaceous, very oblique, strongly veined, persistently grey-downy beneath. *Flowers* in copious short axillary racemes and terminal panicles; bracts ovate-cuspidate; pedicels under 1 in. long.—*Flowers* and pod like that of *C. nodosa*, but much smaller.

4. **C. renigera,** *Wall. Cat.* 5307; branches densely pubescent, leaflets 30–40 moderately small obtuse 3–4 times as long as broad, flowers unknown. *Benth. in Trans. Linn. Soc.* xxvii. 518; *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 71.

BIRMA; Taong-dong mountains and banks of the Irrawaddi, *Wallich.*

Closely allied to *C. marginata*. *Leaves* 1 ft. long; leaflets close, nearly sessile, ligulate-oblong, 1$\frac{1}{2}$–2 in. long, broadly rounded at both ends, slightly oblique, rigidly coriaceous, finely grey-downy below; stipules oblong, cuspidate, large, membranous, persistent, fastened above the base. *Pod* 1 foot long, cylindrical, indehiscent, glabrous.

SUBGEN. 2. **Senna** (*Roxb. ex parte*, as a genus). *Sepals* obtuse. Perfect *stamens* 7, the anthers subequal or those of the 2–3 lowest larger than the others; three posterior filaments without anthers. *Pods* compressed, rarely terete, the seeds usually flattened parallel with the valves.—Some trees, some shrubby herbs.

* *Leaf with a single large gland placed just above the base of the common petiole.*

5. **C. occidentalis,** *Linn.*; *DC. Prodr.* ii. 497; leaflets 6–10 ovate-oblong. *Roxb. Hort. Beng.* 31; *W. & A. Prodr.* 290; *Bot. Reg.* t. 83; *Dalz. & Gibs. Bomb. Fl.* 81. Senna occidentalis, *Roxb. Fl. Ind.* ii. 343. C. fœtida, *Pers. Syn.* i. 457. C. Sophera, *Wall. Cat.* 5317, *ex parte*.

Scattered from the HIMALAYAS, to CEYLON, probably introduced.—DISTRIB. Cosmopolitan in the tropics.

A diffuse subglabrous undershrub, a few feet high, usually only of annual duration. *Leaves* $\frac{1}{2}$ ft. long; leaflets glaucous, fœtid, acuminate, 1–3 in. long, glabrous or finely pubescent. *Racemes* short-peduncled, few-flowered, corymbose, axillary and forming a terminal panicle; bracts thin, ovate-acuminate, caducous; pedicels spreading, $\frac{1}{2}$–$\frac{3}{4}$ in. *Sepals* obtuse, glabrous, $\frac{1}{4}$–$\frac{1}{3}$ in. *Petals* $\frac{1}{2}$ in. pale lilac, conspicuously veined. *Pod* 4–5 in. by $\frac{1}{3}$ in., rather recurved, glabrous, subcompressed, distinctly torulose. *Seeds* 15–30.

6. **C. Sophera,** *Linn.*; *DC. Prodr.* ii. 492; leaflets 12–24 oblong-lanceolate. *Roxb. Hort. Beng.* 31; *Wall. Cat.* 5317, *ex parte*; *W. & A. Prodr.* 287; *Dalz. & Gibs. Bomb. Fl.* 81. Senna Sophera, *Roxb. Fl. Ind.* ii. 347. S. esculenta, *Roxb. Fl. Ind.* ii. 346. Cassia esculenta, *Roxb. Hort. Beng.* 31. C. chinensis, *Jacq. Ic.* t. 73. C. frutescens, *Mill. Dict.* No. 2. C. coromandeliana, *Jacq. Fragm.* 67, t. 100.—*Rheede Hort. Mal.* ii. t. 52.

HIMALAYAS to CEYLON and PENANG.—DISTRIB. Cosmopolitan in the tropics, probably native in Asia only.

Closely allied to *C. occidentalis*, from which it differs by its more shrubby habit, more numerous smaller narrower leaflets and shorter broader more turgid pods, which are not usually torulose when mature.

VAR. *purpurea*; Roxb. Hort. Beng. 31, sp.; leaflets smaller more obtuse not more than 1 in. long, branches slender purple. C. purpurea, *Bot. Reg.* t. 856. Senna purpurea, *Roxb. Fl. Ind.* ii. 342.

** *Leaf furnished with glands on the main rachis between the leaflets.*

7. **C. Tora,** *Linn.*; *DC. Prodr.* ii. 493; glabrous, leaflets 6 obovate-oblong, perfect stamens subequal, pod very long slender subtetragonous, seeds uniseriate. *Roxb. Hort. Beng.* 31; *Wall. Cat.* 5316; *W. & A. Prodr.* 290; *Dalz. & Gibs. Bomb. Fl.* 81. Senna Tora and toroides, *Roxb. Fl. Ind.* ii. 340. C. obtusifolia, *Linn. Sp. Plant.* 539. C. fœtida, *Salisb. Prod.* 326. C. humilis and gallinaria, *Collad. Hist.* 96. C. toroides, *Roxb. Hort. Beng.* 31.—*Rheede Hort. Mal.* ii. t. 53.

Universally spread through our limits in a truly wild state, ascending to 5000 ft. in the CENTRAL HIMALAYAS.—DISTRIB. Cosmopolitan in the tropics.

An annual weed, growing up into an undershrub. *Leaves* distinctly petioled; leaflets 1–1½ in., glaucous, membranous, glabrous; stipules large, linear-subulate, caducous. *Flowers* usually in nearly sessile pairs in the axils of the leaves, the upper crowded. *Corolla* small, bright yellow. *Pods* ½–¾ ft. by ¼ in., membranous, the sutures very broad, the seeds flattened in the same direction as the pod.

C. BICAPSULARIS, *Linn.*; *DC. Prodr.* ii. 494; glabrous, leaflets 6–8, stamens very unequal, pod thick terete, seeds biseriate. *Roxb. Hort. Beng.* 31; *Wall. Cat.* 5313; *W. & A. Prodr.* 286. Senna bicapsularis, *Roxb. Fl. Ind.* ii. 342.

A native of Tropical America, not unfrequently introduced.

A shrub, with virgate woody branches. *Leaves* distinctly petioled; leaflets green, membranous, obtuse, ¾–½ in.; stipules small, subulate, caducous. *Racemes* copious, corymbose, as long as the leaves. *Flowers* middle-sized, bright yellow. *Pods* membranous, curved, sausage-shaped, ½ ft. long, ½ in. thick, the sutures very narrow.

C. TOMENTOSA, *Linn.*; *DC. Prodr.* ii. 496; densely pubescent, leaflets 12–16, stipules narrow caducous, pod narrow turgid many-seeded. *W. & A. Prodr.* 286. C. Wightiana, *Grah. in Wall. Cat.* 5329.

A native of Trop. America, introduced in the Nilghiris and Ceylon.

A tall shrub, with the branches and leaves beneath densely matted with grey tomentum. *Leaves* short-petioled, 3–4 in. long; leaflets oblong, obtuse, oblique at the base. *Flowers* bright-yellow, middle-sized, in copious distinctly peduncled corymbose racemes. Lower *anthers* much larger than the others. *Pod* linear, membranous, 4–5 in. long, finely downy.—C. TOMENTOSA, *Wall. Cat.* 5304 is *C. hirsuta*, Linn., a totally different species, also a native of Tropical America.

8. **C. auriculata,** *Linn.*; *DC. Prodr.* ii. 496; finely downy, leaflets 16–24, stipules broad persistent, pod thin broad few-seeded. *Roxb. Hort. Beng.* 31; *Wall. Cat.* 5303; *W. & A. Prodr.* 290; *Dalz. & Gibs. Bomb. Fl.* 81. Senna auriculata, *Roxb. Fl. Ind.* ii. 349.

Wild in the CENTRAL provinces, the WESTERN PENINSULA and CEYLON; often planted elsewhere.

A tall shrub, with the virgate branches and underside of the leaves finely grey-downy. *Leaves* nearly sessile, 3–4 in. long; leaflets obovate-oblong, rigidly subcoriaceous, ¾–1 in., obtuse or emarginate, with a mucro; stipules large and foliaceous.

Flowers very large and showy, an inch deep, bright yellow, in copious corymbose racemes. *Pod* 4–5 in. long by ½–⅝ in., straight, ligulate, glabrous, flexible, dark brown, with a distinct space between the uniseriate seeds.

*** *Leaf-rachis without glands.*

9. **C. obovata,** *Collad. Hist. Cass.* 92, t. 15, A; stipules lanceolate persistent, leaflets 8–12, racemes narrow, pod flat oblong much recurved with a crest on the middle of the valve opposite each seed. *Wall. Cat.* 5319; *Boiss. Fl. Orient.* ii. 631. C. Senna, *Linn. Sp. Plant.* 539, *ex parte.* C. obtusa, *Roxb. Hort. Beng.* 31; *W. & A. Prodr.* 288; *Wight. Ic.* t. 757. Senna obtusa, *Roxb. Fl. Ind.* ii. 344. C. Burmanni, *Wight in Madras Journ.* vi. t. 5.

PUNJAB, SCINDE, WESTERN PENINSULA.—DISTRIB. Arabia, Egypt, Abyssinia.

Subglabrous, scarcely shrubby, 1–4 ft. high. *Leaves* distinctly petioled, 2–3 in. long; leaflets obovate-oblong, membranous, very glaucous, obtuse, with a minute mucro, ½–1½ in. *Racemes* distinctly peduncled, equalling or exceeding the leaves; pedicels very short. *Sepals* glabrous, very obtuse. *Corolla* middle-sized, pale yellow. *Stamens* very unequal. *Pod* thin, glabrous, flexible, 1–1½ in. by ⅝–¾ in, short-stalked, narrowed suddenly at both ends, 6–12-seeded; sutures very thin.—C. ANGUSTIFOLIA, *Vahl.* (C. lanceolata, *Wall. Cat.* 5318, *Royle Ill.* t. 37, *W. & A. Prodr.* 288; Senna officinalis, *Roxb. Fl. Ind.* ii. 346), with 10–16 oblong-lanceolate acute leaflets and nearly straight oblong pods without crests, is a native of Tropical Africa and has no claim to be considered indigenous in India.

10. **C. alata,** *Linn.*; *DC. Prodr.* ii. 492; stipules deltoid persistent, leaflets 16–28 large, racemes narrow, pod long ligulate with a broad wing down the middle of each valve. *Roxb. Hort. Beng.* 31; *Wall. Cat.* 5301; *W. & A. Prodr.* 287; *Wight Ic.* t. 253. Senna alata, *Roxb. Fl. Ind.* ii. 349. C. bracteata, *Linn. fil.*; *DC. loc. cit.* C. herpetica, *Jacq. Obs.* ii. 24, t. 45, fig. 2.

LOWER BENGAL, WESTERN PENINSULA, BIRMA and MALACCA.—DISTRIB. Cosmopolitan in the tropics,

A shrub, with very thick finely downy branches. *Leaves* subsessile, 1–2 ft. long; leaflets oblong, obtuse, 2–6 in. long, minutely mucronate, rigidly subcoriaceous, glabrous or obscurely downy beneath, broadly rounded, oblique at the base; rachis narrowly winged on each side of the face. *Racemes* peduncled, ½–1 ft.; bracts large, membranous, caducous. *Corolla* yellow, very distinctly veined. *Stamens* very unequal. *Pod* membranous, dehiscent, straight, glabrous, 4–8 in. by ½–⅝ in. *Seeds* 50 or more.

11. **C. siamea,** *Lam.*; *DC. Prodr.* ii. 499; stipules minute caducous, leaflets 12–28 with a minute mucro, racemes corymbose forming a long end panicle, pod ligulate flat not winged, the sutures slightly thickened. C. florida, *Vahl*; *DC. Prodr.* ii. 499; *W. & A. Prodr.* 288; *Bedd. Fl. Sylv.* t. 179. C. sumatrana, *Roxb. Hort. Beng.* 31; *DC. Prodr.* ii. 506; *Wall. Cat.* 5305. Senna sumatrana, *Roxb. Fl. Ind.* ii. 347.

WESTERN PENINSULA, CEYLON, MALAYAN PENINSULA and SIAM.—DISTRIB. Malay isles.

A low tree, with virgate finely grey-downy terete branchlets. *Leaves* ½–1 ft.; leaflets oblong, glaucous, subcoriaceous, emarginate, strongly veined, subglabrous, distinctly stalked, 2–3 in. long. *Corymbs* crowded, both axillary and in a terminal panicle ½–1 ft. long, with grey-pubescent branches. *Sepals* downy, very obtuse. *Petals* middle-sized, bright yellow, not veined. *Stamens* subequal. *Pod* nearly straight, flat, distinctly stalked, 6–9 in. by ½ in., firmer in texture and with thicker sutures than in the two next.

12. **C. montana,** *Heyne*; *DC. Prodr.* ii. 499; stipules minute caducous, leaflets 20–30 with a large mucro, racemes corymbose forming a long end pa-

nicle, pod ligulate thin flat not winged, with thin sutures. *W. & A. Prodr.* 289; *Dalz. & Gibs. Bomb. Fl.* 81. C. setigera, *DC. Prodr. loc. cit.*; *Wall. Cat.* 5330.

Hills of the WESTERN PENINSULA.

A shrub, with slender glabrous obscurely downy virgate branchlets. *Leaves* petioled, 4–6 in.; leaflets membranous, firm, oblong, obtuse, glabrous, glaucous, 1–$1\frac{1}{2}$ in. long, tipped with a conspicuous bristle. *Corymbs* copious, both axillary and forming long end panicles. *Sepals* obtuse, glabrous. *Corolla* yellow, middle-sized, not veined. *Stamens* subequal. *Pod* stalked, nearly straight, 3–5 in. by $\frac{1}{2}$–$\frac{5}{8}$ in., glossy, brown, 12-20-seeded.

13. **C. timoriensis,** *DC. Prodr.* ii. 499; stipules persistent foliaceous, leaflets 20–24 with a minute mucro, racemes corymbose forming a long end panicle, pod ligulate thin flat not winged, the sutures thin. C. palmata, *Wall. Cat.* 5306.

BIRMA, MARTABAN, TENASSERIM, CEYLON.—DISTRIB. Malay isles, Philippines, N. Australia.

A low tree, with slender finely downy branches. *Leaves* $\frac{1}{2}$–$\frac{3}{4}$ ft., distinctly petioled; leaflets oblong, obtuse, 1–2 in., membranous, pale green, finely downy below. *Sepals* downy, very obtuse. *Corolla* bright yellow, middle-sized, slightly veined. *Pod* straight, thin, glossy, flexible, dehiscent, 5–6 in. by $\frac{1}{2}$–$\frac{5}{8}$ in., distinctly stalked, 12–20-seeded.

SUBGEN. 3. **Psilorhegma,** *Vogel.* Like the last, but all the ten stamens perfect, with subequal anthers.

14. **C. glauca,** *Lam.*; *DC. Prodr.* ii. 495; *Wall. Cat.* 5312; *W. & A. Prodr.* 289; *Bedd. Fl. Sylv.* 91. C. surattensis, *Burm. Fl. Ind.* 97. C. arborescens, *Vahl Symb.* iii. 56; *Roxb. Hort. Beng.* 31. C. fastigiata, *Vahl Symb.* iii. 57; *W. & A. Prodr.* 290. Senna arborescens, *Roxb. Fl. Ind.* ii. 345.

HIMALAYAS to CEYLON and MALACCA.—DISTRIB. Malay isles, Trop. Australia, Polynesia.

A tall tree, with glabrous terete branchlets. *Leaves* distinctly petioled, $\frac{1}{2}$–$\frac{3}{4}$ ft.; leaflets ovate, acute or subobtuse, 2–4 in. long, subcoriaceous, very glaucous; rachis with conspicuous glands between the lower, rarely (*C. fastigiata*, Vahl), between all the leaves; stipules narrow, caducous. *Racemes* corymbose, not panicled. *Sepals* large, obtuse. *Flowers* large, bright yellow. *Pod* flat, thin, strap-shaped, glabrous, 6–8 in. long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad, distinctly stalked, 20–30-seeded.

VAR. *suffruticosa*, Koenig; DC. Prodr. ii. 496, sp.; leaflets 16–18 smaller more numerous obtuse 1–2 in. long, flowers and pods much smaller, the latter not more than 3–4 in. long 10–12-seeded. C. suffruticosa, *Wall. Cat.* 5311; *W. & A. Prodr.* 289. C. speciosa, *Roxb. Hort. Beng.* 31. Senna speciosa, *Roxb. Fl. Ind.* ii. 347. C. Horsfieldii, *Miq. Fl. Ind. Bat.* i. 99.—Distribution of the type.

SUBGEN. 4. **Lasiorhegma,** *Benth.* *Sepals* narrow. *Stamens* 5–10, all perfect. *Pod* small, strap-shaped, flat, dehiscent, the seeds compressed parallel with the valves.—Diffuse low slender annual or perennial herbs.

* *Leaflets 4, large, membranous.*

15. **C. Absus,** *Linn.*; *DC. Prodr.* ii. 500; *Roxb. Hort. Beng.* 31; *Wall. Cat.* 5314; *W. & A. Prodr.* 291. C. exigua, *Roxb. Hort. Beng.* 31. Senna Absus, *Roxb. Fl. Ind.* ii. 340. S. exigua, *Roxb. Fl. Ind.* ii. 339. C. coccinea, *Wall. Cat.* 5315.

Foot of the WESTERN HIMALAYAS to CEYLON.—DISTRIB. Everywhere in the tropics of old world.

An erect annual, 1–2 ft. high, with stem and leaves clothed with grey bristly viscose hairs. *Leaves* long-petioled; leaflets oblong, very oblique, 1–2 in. long, obtuse or subacute: stipules small, linear, persistent. *Racemes* narrow, equalling or exceeding the leaves. *Sepals* lanceolate, bristly, $\frac{1}{6}$–$\frac{1}{5}$ in. *Corolla* reddish-yellow, very small. *Pod* oblique, ligulate, 1–1½ in. long, 5–6-seeded, the thin valves beset with grey bristly hairs.

** *Leaflets very numerous, close, small, narrow, rigidly subcoriaceous* (Mimosoideæ).

16. **C. pumila,** *Lam.*; *DC. Prodr.* ii. 504; gland of petiole stipitate, stamens 5, seeds 6–12. *Wall. Cat.* 5327; *W. & A. Prodr.* 292. C. prostrata, *Roxb. Hort. Beng.* 32; *Dalz. & Gibs. Bomb. Fl.* 82. Senna prostrata, *Roxb. Fl. Ind.* ii. 352.

From the HIMALAYAS (ascending to 6–7000 ft.) to CEYLON.—DISTRIB. Malay isles, Trop. Australia.

A low very diffuse shrub, with slender finely downy branches. *Leaf* 1–2 in. long; leaflets 20–40, $\frac{1}{4}$–$\frac{1}{3}$ in. long, distinctly mucronate, the midrib close to the upper border; stipules linear, rigid, persistent. *Flowers* usually solitary in the axils of the leaves, on very short pedicels. *Sepals* $\frac{1}{8}$ in. *Corolla* little exserted. *Anthers* 5 equal. *Pod* 3¼–1½ in. by $\frac{1}{8}$–$\frac{1}{6}$ in.—Probably this and the next are mere varieties of *C. mimosoides.*

17. **C. Kleinii,** *W. & A. Prodr.* 293; gland of petiole stipitate, stamens 10, seeds 10–15. C. dimidiata, *Klein*; *Wall. Cat.* 5328, *not Don.*

WESTERN PENINSULA and CEYLON.—DISTRIB. Java.

Very like *C. pumila*, but more robust, the branches thinly or densely pilose. *Leaflets* 20–40, reduced to 8–12 on the lowest leaves, $\frac{3}{8}$–$\frac{1}{2}$ in. long, rigidly coriaceous, strongly veined, with a distinct oblique mucro, the midrib close to the upper border. *Flowers* 1–3 together in the axils of the leaves, on downy bracteate pedicels. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ in. *Petals* obovate, little exserted. *Pod* 1½–2 in. long, rather recurved, blackish, glabrescent.

18. **C. mimosoides,** *Linn.*; *DC. Prodr.* ii. 505; gland of petiole sessile, stamens 10 rarely 5, seeds 10–20. C. angustissima, *Lam.*; *DC. Prodr. loc. cit.*; *W. & A. Prodr.* 292. C. Roxburghiana, *Grah. in Wall. Cat.* 5323. C. amœna, *Ham. in Wall. Cat.* 5321. C. sensitiva and tenella, *Roxb. Hort. Beng.* 32. Senna sensitiva and tenella, *Roxb. Fl. Ind.* 353-4.

HIMALAYAS, ascending to 5–6000 ft. in KUMAON and KHASIA, to CEYLON and MALACCA.—DISTRIB. Cosmopolitan in Tropics.

A low diffuse perennial, with slender shrubby finely downy branches. *Leaves* 1–3 in. long, with a solitary sessile gland on the rachis below the leaflets; leaflets 60–100, linear, rigidly coriaceous, $\frac{1}{8}$–$\frac{1}{6}$ in. long, obliquely mucronate, with the midrib close to the upper border; stipules large, linear-subulate, persistent. *Flowers* 1–2 together in the axils of the leaves on short pedicels. *Sepals* $\frac{1}{8}$–$\frac{1}{4}$ in., lanceolate-acuminate, bristly. *Corolla* little exserted. *Stamens* 10, alternately longer and shorter. *Pod* strap-shaped, flat, dehiscent, 1½–2 in. by $\frac{1}{6}$ in, nearly straight, glabrescent or finely downy; septa more or less oblique.

VAR. 1. *dimidiata*; Roxb. Hort. Beng. 32, sp.; leaves and flowers of the type but the stamens 5 only. Senna dimidiata, *Buch. in Roxb. Fl. Ind.* ii. 352.—Himalayas.

VAR. 2. *Wallichiana*; DC. Prodr. ii. 505, sp.; finely downy, leaflets larger $\frac{1}{4}$–$\frac{1}{3}$ in. long and less rigid, flowers larger $\frac{1}{4}$–$\frac{1}{2}$ in. long. *Wall. Cat.* 5320; *W. & A. Prodr.* 292. C. Leschenaultii, *Wall. Cat.* 5325. C. myriophylla, *Wall. Cat.* 5326. C. Telfairiana, *Wall. Cat.* 5324; *Bot. Mag.* t. 5874.—Distribution of the type.

VAR. 3. *auricoma*; Grah. in Wall. Cat. 5322, sp.; flowers and leaves of the last, but the branches densely clothed with fine spreading hairs.

DOUBTFUL SPECIES.

C. JAVANICA, *Linn.*; *DC. Prodr.* ii. 490, *Wall. Cat.* 5309 (C. Bacillus, *Gaertn.*; *Roxb. Fl. Ind.* ii. 337. *Wt. Icones*, t. 252) differs from *C. nodosa* by its smaller and more obtuse leaflets. It is sometimes cultivated within our limits and is wild in the Malay isles. A plant gathered by Griffith near Prome is either a variety with leaflets densely pubescent beneath or a new species. The inflorescence of both this and the Malay plant corresponds with that of *C. nodosa.*

104. **CYNOMETRA,** Linn.

Erect unarmed trees. *Leaves* with few coriaceous odd-pinnate leaflets. *Flowers* copious, minute, in axillary corymbs or racemes. *Calyx* with a very short tube and subbasal disk; divisions 4–5, oblong, imbricated. *Petals* 5, oblanceolate, equal, not exserted. *Stamens* 10, or in *C. polyandra* indefinite, filaments erect, free, filiform, exserted; anthers small, oblong, versatile, dehiscing longitudinally. *Ovary* sessile or short-stalked, 2-ovuled; style filiform, stigma capitate. *Pod* turgid, oblique-oblong, with very thick indehiscent usually rugose tough somewhat fleshy valves. *Seed* exalbuminous, central, filling up the cavity.—DISTRIB. Species 20, spread everywhere in the tropics.

SUBGEN. 1. **Eucynometra.** *Stamens* 10.

1. **C. ramiflora,** *Linn.*; *DC. Prodr.* ii. 509; leaflets 2–4, racemes usually solitary corymbose axillary from the branchlets, pod turgid rugose. *W. & A. Prodr.* 293; *Dalz. & Gibs. Bomb. Fl.* 83; *Bedd. Fl. Sylv.* t. 315. C. cauliflora, *Wall. Cat.* 5816, *ex parte.*

WESTERN PENINSULA and CEYLON.—DISTRIB. Malay isles, Philippines, N. Australia.

Leaflets 1-jugate and 2-jugate mixed or often all 1-jugate, subsessile, if 2-jugate (var. *heterophylla*, Thwaites) the upper much the largest, oblong, subacute very oblique, 3–6 in. long; petiole $\frac{1}{3}$–$1\frac{1}{2}$ in. *Racemes* few-flowered, corymbose, sessile from the axils of the leaves of the branchlets, with the primary axis not produced, rarely geminate; outer scales ovate, $\frac{1}{8}$–$\frac{1}{6}$ in.; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. *Sepals* $\frac{1}{8}$ in. *Pods* turgid, very rugose, $\frac{1}{2}$-1 in. long, subsessile.

VAR. *mimosoides*, Wall. Cat. 5817, sp.; leaflets all bijugate not so unequal as in the bijugate form of the type much smaller 1–3 in. long more obtuse and thicker, flowers and pod smaller, the latter pointed and very deeply wrinkled. C. bijuga, *Spanog.*; *Miq. Flor. Ind. Bat.* i. 78.—Western Peninsula, Pegu, Tenasserim.

2. **C. travancorica,** *Bedd. Fl. Sylv.* t. 316; leaflets 2, flowers in sessile corymbs from the branchlets, pod flat smooth.

SOUTH TRAVANCORE and in the CARNATIC near Tinnevelly, alt. 2–4000 ft., *Beddome.*

Petioles $\frac{1}{8}$–$\frac{1}{6}$ in.; leaflets always unijugate, oblique oblong-lanceolate, subacute, glabrous, 2–3 in. long. *Racemes* solitary, copious, rounded, few-flowered, with the central axis not at all produced; bracts $\frac{1}{8}$ in., deltoid; pedicels erecto-patent, $\frac{1}{8}$–$\frac{1}{4}$ in. *Sepals* $\frac{1}{8}$ in., finally reflexed. *Filaments* twice the length of the sepals. *Pod* flat, smooth, firm, semicircular, sessile, 1–$1\frac{1}{4}$ in. long.

3. **C. inæquifolia,** *A. Gray Bot. U.S. Expl. Expedit.* 473; leaflets 4–6, flowers in very dense oblong sessile solitary or geminate racemes from the branchlets, pod flat smooth.

MALACCA, *Maingay.*—DISTRIB. Philippines, *Cuming*, 1297.

Leaflets subcoriaceous, rigid, glabrous, oblique, obovate-oblong, subequal, in our specimens 2–3 in. long. *Flowers* in very dense oblong sessile cone-like racemes, $1\frac{1}{2}$–2 in. long, the central axis produced; outer bracts round-cordate, obtuse, $\frac{1}{4}$ in.; pedicels

erecto-patent, ⅙–¼ in. *Sepals* ⅛ in., permanently ascending. *Filaments* twice the calyx. *Pod* ¼ in. thick, woody, oblique obovoid, 2-2¼ in. long, not at all wrinkled.—Col. Beddome has found a plant in South Canara with 3 pairs of leaflets and similar bracts, of which the flowers are not yet known.

4. **C. cauliflora,** *Linn.*; *DC. Prodr.* ii. 509; leaflets usually 2, flowers in dense sessile congested racemes from thick branches with the axis produced, pod turgid wrinkled. *Roxb. Hort. Beng.* 32; *Wall. Cat.* 5816, *ex parte*; *W. & A. Prodr.* 293; *Bedd. Fl. Sylv.* t. 315 (*analysis*).

WESTERN PENINSULA, CEYLON, MALACCA.—DISTRIB. Malay isles.

Branchlets slender, glabrous. *Petioles* very short; leaflets very rarely bijugate, and if so very unequal, rigidly coriaceous, sessile, glossy, obovate, very oblique obtuse or subacute, 3–6 in. long. *Racemes* congested in dense rounded masses, not more than an inch long, the central axis of each produced, the short erecto-patent pedicels subtended by small roundish spreading persistent bracts. *Calyx* ⅛ in. *Pod* like that of *C. ramiflora*, oblique oblong, very turgid, 1–1½ in. long.

SUBGEN. 2. **Pseudocynometra,** *W. & A.* *Stamens* indefinite.

5. **C. polyandra,** *Roxb. Cor. Pl.* iii. t. 286; *Hort. Beng.* 32; *Fl. Ind.* ii. 372; *DC. Prodr.* ii. 509; *Wall. Cat.* 5815; *W. & A. Prodr.* 294.

KHASIA, SILHET, PENANG, MALACCA.

Branchlets slender, glabrous. *Leaves* nearly sessile, ½–¾ ft.; leaflets 4–6, usually the latter, sessile, oblique-oblong or obovate, 2–4 in. long, rigidly subcoriaceous, acute or subobtuse, glossy. *Flowers* in dense corymbs, sessile in the axils of the leaves of the branchlets; pedicels downy, ½–1 in. *Sepals* ⅜ in., reflexed. *Stamens* 40–60, much exserted. *Pod* oblique oblong, smooth, woody, 2 in. long.

105. SINDORA, Miquel.

Unarmed trees. *Leaves* abruptly pinnate; leaflets few. *Flowers* small, panicled. *Calyx* with a very short tube and basal disk; segments 4, valvate, the two upper being connate. *Petal* one, the same size and shape as the upper lip of the calyx. *Stamens* 10, the upper one free from the others, shorter and anantherous, the rest declinate, shortly monadelphous, unequal, the upper longest, exserted; anthers oblong, versatile, dehiscing longitudinally. *Ovary* 2-ovuled, short-stalked; stigma long, filiform, circinate, stigma minute terminal. *Pod* like that of *Guilandina*, oblique, round-oblong, dehiscent, the flat, hard valves armed all over the face with straight large firm prickles.—DISTRIB. Another species or variety in Sumatra.

1. **S. Wallichii,** *Benth. in Hook. Ic.* t. 1017–8; branchlets and leaves below shortly tomentose, leaflets 4–6, bracts persistent, calyx prickly. Guilandina Wallichiana, *Grah. in Wall. Cat.* 5805. Echinocalyx, *Benth. Gen. Plant.* 584, 1003.

SINGAPORE, *Wallich*; MALACCA, *Griffith, Maingay.*

A small erect unarmed tree, with branches clothed with short brown pubescence. *Leaflets* rigidly coriaceous, 2–3 in. long, subobtuse, oblong, glossy above, closely pubescent beneath. *Panicles* dense, axillary and terminal; bracts cordate, roundish, spreading or reflexed; pedicels nearly as long as the calyx. *Calyx* ⅙ in., brown-downy, the sepals armed towards the tip with large firm prickles. *Pod* glabrous, sublignose, 2–3 in. long.

VAR. 1. *siamensis*, Teysm., sp.; leaflets 6 obovate distinctly emarginate larger thinner strongly veined the end one 3–4 in. long.—Siam, *Teysmann.*

VAR. 2. *intermedia*, Baker; leaflets 6–8 smaller more acute, flowers smaller, and receding towards the next by its shorter pedicels, caducous bracts, calyx without prickles and more densely velvety sepals and branches.—Malacca, *Maingay.*

2. **S. velutina,** *Baker*; branchlets and leaves below densely tomentose, leaflets 10–12, bracts caducous, calyx not prickly.

MALACCA, *Dr. Maingay.*

Leaves $\frac{1}{2}$–$\frac{3}{4}$ ft. *Pubescence* of branchlets calyx and underside of leaves much longer and more dense than in the last, bright brown. *Leaflets* 3–3½ in. long, oblong, subacute, very thick and rigid. *Pedicels* very short. *Buds* $\frac{1}{3}$ in. long. *Ovary* and lower part of filaments more densely pubescent than in the last. *Pod* not seen.

106. DIALIUM, Linn.

Erect unarmed trees. *Leaves* odd-pinnate, with alternate leaflets. *Flowers* copious, small, obscure, in ample terminal panicles. *Calyx-tube* very short; sepals lanceolate or ovate-lanceolate, subequal, much imbricated. *Petals* 0. *Stamens* 2, erect, included; anthers dehiscing longitudinally, attached near the base. *Ovary* sessile, 2-ovuled; style filiform, stigma terminal. *Pod* firm, dry, indehiscent, oblong, 1-seeded; endocarp pulpy. *Seed* albuminous.—DISTRIB. Species about 10, cosmopolitan in the tropics.

* *Sepals oblong-lanceolate, not more than* $\frac{1}{12}$ *in. broad.*

1. **D. ovoideum,** *Thwaites Enum.* 97; leaflets 3–5 the end one cuneate at the base, branches of the panicle ascending, pedicels nearly as long as the calyx, pod brown-velvety. *Bedd. Fl. Sylv.* t. 181.

CEYLON, districts north of Kandy, *Thwaites.*

A tall tree. *Leaflets* conspicuously alternate, rigidly subcoriaceous, thinner than in the following, glabrous on both sides, strongly veined, not glossy above, 2–4 in. long, subobtuse, narrowed gradually from the middle to both ends; petiolules $\frac{1}{6}$–$\frac{1}{4}$ in. *Panicle* ample, with slender finely grey-downy branches. *Bud* lanceolate, $\frac{1}{6}$ in. long. *Sepals* subpetaloid, lanceolate, under $\frac{1}{12}$ in. broad, thinly grey-downy. *Filament* nearly as long as the anther in the developed flower. *Pod* ovoid, slightly compressed, $\frac{1}{2}$–$\frac{5}{8}$ in. long, eatable, with an agreeable acid flavour; seeds round, compressed, shining, yellow or reddish-brown.—Closely allied to the Javan *D. indum*, Linn. (Bennett Pl. Jav. Rar. t. 30), which is not known within our limits, and differs by its oblong buds and shorter filaments and petiolules.

2. **D. Maingayi,** *Baker*; leaflets 9 rounded at the base, branches of the panicle ascending, pedicels short, pod brown-velvety.

SINGAPORE, *Dr. Maingay.*

Leaflets more crowded on the rachis than in the last, distinctly alternate, oblong-cuspidate, glabrous, 3–4 in. long, rigidly coriaceous, glossy above, dull and paler below; petiolules $\frac{1}{8}$–$\frac{1}{6}$ in. *Panicle* ample, close, with rigidly erecto-patent main branches, the lowest springing from the axils of the upper leaf; pedicels ascending, not more than half as long as the calyx. *Sepals* $\frac{1}{6}$ in., oblong-lanceolate, thinly coated on the back with grey-brown pubescence. *Filaments* much shorter than the anthers. *Pod* obovoid, 1 in. long, firm, persistently brown-velvety.

3. **D. laurinum,** *Baker*; leaflets 7 rounded at the base, branches of the panicle ascending, pedicels short, pod not velvety.

MALACCA, *Dr. Maingay.*

Leaflets oblong, broadly rounded at the base, narrowed suddenly to a subobtuse point, 4–5 in. long, rigidly coriaceous, glossy above, glabrous, opaque, strongly veined beneath; petiolules $\frac{1}{4}$–$\frac{1}{3}$ in. *Panicles* axillary and terminal; pedicels very short, ascending. *Bud* ovoid-oblong, $\frac{1}{6}$ in. long. *Sepals* oblong-lanceolate, densely grey-downy on the back. *Filaments* very short. *Pod* roundish, 1 in. deep, fragile, black, thinly coated with greyish-brown down. *Seed* as large as a bean.

4. **D. patens,** *Baker*; leaflets 3–5 rounded at the base, branches of the panicle spreading, pedicels as long as the calyx, pod not velvety.

MALACCA, *Griffith, Maingay.*

Leaflets opposite or subopposite, oblong, rigidly coriaceous or subcoriaceous, glabrous, 3–5 in. long, obtusely pointed, finely veined, rather glossy; petiolules $\frac{1}{6}$–$\frac{1}{4}$ in. *Panicles* both axillary and terminal, ample, flexuose with the distant main branches spreading or even sometimes decurved; pedicels ascending, spreading or cernuous. *Bud* $\frac{1}{6}$ in., ovoid-oblong. *Sepals* oblong-lanceolate, subpetaloid, thinly grey-downy. *Filaments* very short. *Pod* 1 in. long, round-oblong, firm, black, thinly coated with grey-brown down; seed oblong, $\frac{5}{8}$–$\frac{3}{4}$ in. long.

** *Sepals ovate-lanceolate $\frac{1}{8}$–$\frac{1}{6}$ in. broad.*

5. **D. platysepalum,** *Baker.*

MALACCA, *Griffith, Maingay.*

Leaflets 5–7, distant, conspicuously alternate, oblong, pointed, 4–6 in. long, rounded or the end one subcuneate at the base, rigidly coriaceous, rather glossy above, finely veined beneath, with a persistent coating of bright yellowish-brown silky pubescence; petiolules $\frac{1}{4}$ in. *Panicles* ample, deltoid, moderately close, terminal and axillary, the branches clothed with fine brown silky pubescence, the main ones erecto-patent; pedicels ascending or cernuous, much shorter than the calyx. *Bud* ovoid, under $\frac{1}{4}$ in. long. *Sepals* leathery, densely brown-velvety on the back, reflexed when the flower is fully expanded. *Filaments* thick and fleshy, nearly as long as the anthers. *Pod* round-oblong, $\frac{5}{8}$–$\frac{3}{4}$ in. long, hard, persistently brown-velvety. *Seeds* oblong, compressed, glossy, chestnut-brown.

VAR. *Wallichii,* Baker; leaflets 9–11 closer smaller oblong-lanceolate acuminate, the upper 2–2$\frac{1}{2}$ in. long, petiolules shorter. "Connaracea?" *Wall. Cat.* 8534.—Sincapore, *Wallich.* Malacca, *Maingay.*

107. HARDWICKIA, Roxb.

Unarmed trees. *Leaves* abruptly pinnate, with few leaflets. *Flowers* very abundant, minute, panicled. *Calyx* with scarcely any tube and a subbasal disk; sepals usually 5, rarely 4, oblong, imbricated, subpetaloid, persistent. *Corolla* 0. *Stamens* twice the sepals in number, included or exserted; filaments filiform; anthers versatile, dehiscing longitudinally. *Ovary* sessile, 2-ovuled; style filiform, stigma capitate. *Pod* subindehiscent, dry, with only the upper ovule perfected; seeds exalbuminous.—DISTRIB. One other species, Trop. African.

1. **H. binata,** *Roxb. Cor. Pl.* iii. 6, t. 209; leaflets 2 sessile oblique flabellately veined, stamens included, stigma large peltate, racemes few-flowered, pod strap-shaped thin with the seed at the tip. *Roxb. Fl. Ind.* ii. 423; *DC. Prodr.* ii. 487; *Wall. Cat.* 5808; *W. & A. Prodr.* 284; *Dalz. & Gibs. Bomb. Fl.* 83; *Bedd. Fl. Sylv.* t. 26.

BEHAR and WESTERN PENINSULA, ascending to 3500 ft.

A tree 100 feet high, with slender glabrous branches. *Leaflets* like those of a *Bauhinia,* oblique, ovate-trapezoid, 1–3 in. long, obtuse or subacute, with 4–5 ribs radiating from the base. *Panicles* axillary and terminal; pedicels as long as the calyx, not bracteolate. *Sepals* oblong, obtuse, under $\frac{1}{8}$ in. long. *Pod* like that of *Spatholobus,* thin, flexible, 2–3 in. long.

2. **H. pinnata,** *Roxb. Fl. Ind.* ii. 425; leaflets 4–6 alternate petiolulate not oblique, stamens exserted, stigma minute, racemes dense narrow, pod obovoid or oblong nearly or quite filled up by the seed. *Wall. Cat.* 5807; *DC. Prodr.* ii. 487; *W. & A. Prodr.* 284; *Bedd. Fl. Sylv.* t. 255.

Ghauts of CANARA, TRAVANCORE and the CARNATIC.

Leaflets oblong, rigidly coriaceous, acute, 2–4 in. long, venulose, the upper of the uppermost pair sometimes apparently terminal; midrib central, veining pinnate; petiolules $\frac{1}{6}$–$\frac{1}{4}$ in. *Panicles* copious, axillary and terminal, formed of dense slender cylindrical racemes; pedicels spreading, $\frac{1}{24}$–$\frac{1}{12}$ in. *Calyx* broadly campanulate, under $\frac{1}{12}$ in. long, with a pair of minute adpressed bracteoles. *Filaments* twice as long as the sepals. *Pod* turgid, 1$\frac{1}{2}$–2 in. long, rigid, sublignose, not at all oblique.

108. **CRUDIA,** *Schreb.*

Glabrous shrubs or trees. *Leaves* odd-pinnate,* with conspicuously alternate leaflets. *Flowers* in terminal or lateral racemes. *Calyx-tube* very short, with the disk nearly basal; segments 4, oblong, imbricated, persistent, reflexed. *Petals* 0. *Stamens* 10, exserted, filaments free, filiform; anthers oblong, versatile, dehiscing longitudinally. *Ovary* stalked, few-ovuled; style filiform, stigma terminal capitate. *Pod* flat, rigidly coriaceous, 2-valved. *Seeds* exalbuminous.—DISTRIB. Species 10, one African, the rest Trop. American.

1. **C. zeylanica,** *Benth. in Trans. Linn. Soc.* xxv. 314; *Bedd. Fl. Sylv.* t. 190. Detarium zeylanicum, *Thwaites Enum.* 414.

CEYLON, near Caltura, *Thwaites.*

A tall tree, with slender glabrous branchlets. *Leaflets* 3–5, oblong, short-stalked, rigidly subcoriaceous, rather oblique, obtusely pointed, bright green above, paler beneath, strongly veined. *Racemes* dense, terminal, on short branches, as long as or shorter than the leaves; pedicels reflexed, finally $\frac{1}{6}$ in., equalling the reflexed coriaceous sepals. *Ovary* distinctly stalked, oblique-oblong, densely clothed with pale brown tomentum. *Ovules* 3–4. *Pod* not seen.

109. **SARACA,** Linn.

Erect trees. *Leaves* abruptly pinnate, glabrous, rigidly coriaceous. *Flowers* in dense sessile corymbose axillary panicles, with subpetaloid reddish bracteoles. *Calyx* with the disk at the summit of a cylindrical tube; divisions 4, oblong, unequal, subpetaloid. *Corolla* 0. *Stamens* 3–8, exserted with long filiform filaments, and oblong versatile anthers opening longitudinally. *Ovary* many-ovuled with a stalk produced beyond the disk; style long, filiform, stigma minute capitate. *Pod* flat, dehiscent, rigidly coriaceous. *Seeds* exalbuminous.—DISTRIB. Species 6, restricted to India and Malaya.

1. **S. indica,** *Linn. Mant.* 98; leaflets 6–12, petiolules short, bracteoles persistent ascending, sepals about half as long as the calyx-tube, stamens usually 7. *Bedd. Fl. Sylv.* t. 57. S. arborescens, *Burm. Fl. Ind.* 85, t. 25, fig. 2. S. minor and Zollingeriana, *Miq. Fl. Ind. Bat.* i. 84. Jonesia Asoca, *Roxb. Fl. Ind.* ii. 218; *DC. Prodr.* ii. 487; *Wall. Cat.* 5822; *W. & A. Prodr.* 284; *Wight Ic.* t. 206; *Bot. Mag.* t. 3018; *Dalz. & Gibs. Bomb. Fl.* 82. J. pinnata, *Willd. Sp. Pl.* ii. 287.—*Rheede Hort. Mal.* v. t. 59.

From the CENTRAL and EASTERN HIMALAYAS, ascending to 2000 feet in KUMAON, CEYLON and MALACCA.—DISTRIB. Malay isles.

A low erect tree. *Leaves* sessile or subsessile; leaflets oblong or oblong-lanceolate, acute or obtuse, 3–9 in. long rigidly subcoriaceous. *Corymbs* dense, 3–4 in. broad; pedicels stout, $\frac{1}{4}$–$\frac{1}{2}$ in. long, below the oblong-spathulate ascending amplexicaul bracteoles. *Sepals* $\frac{1}{4}$–$\frac{1}{3}$ in., obovate-oblong. *Filaments* three times as long as

* Wrongly given as equally pinnate in the Key.

the sepals. *Pod* 4–10 in. by $1\frac{1}{2}$–2 in., like that of a *Millettia*, 4–8-seeded. *Seeds* oblong, compressed, $1\frac{1}{2}$ in. long.

2. **S. cauliflora,** *Baker*; leaflets 10–12, petiolules long, bracteoles 0, corymbs dense from thick old branches, sepals half as long as the calyx-tube, stamens about 7.

MALACCA, *Griffith, Maingay.*

Petiolules $\frac{1}{2}$ in. long; leaflets rigidly subcoriaceous, strongly veined; upper oblanceolate-oblong, acute, a foot or more long; lower shorter, more oblong. *Corymbs* solitary or geminate, nearly sessile, ample, dense, 4–6 in. broad; main branches stout, woody; pedicels of lower flowers disarticulated at the base before the upper expand; bracteoles none to be seen in the specimens. *Flowers* the same size as in the last, but the tube and pedicels more slender.—Closely approaches the Malayan *S. declinata*, Miquel, in habit, foliage and inflorescence, but that has only 4 stamens.

3. **S. Lobbiana,** *Baker*; leaflets 10–12, petiolules short, bracteoles large caducous, corymbs sparse from young slender branches, sepals half as long as the calyx-tube, stamens 7–8.

MARTABAN; foot of Mount Kola, Moulmein, *Lobb.*

A tree 40 feet high. *Petiolules* $\frac{1}{4}$ in.; leaflets thinner than in the two last, oblanceolate-oblong, subacute, $\frac{1}{2}$–1 ft. long. *Corymbs* solitary from leafless slender branches, with only a few erecto-patent branches; bracteoles $\frac{3}{8}$–$\frac{1}{2}$ in., oblong-spathulate, navicular, amplexicaul, falling before the flowers expand. *Sepals* oblong, $\frac{1}{4}$ in. deep. *Stamens* twice as long as the sepals. *Flowers* yellow, turning to reddish.

4. **S. triandra,** *Baker*; leaflets 4–8, petiolules short, bracteoles spreading persistent, stamens 3–4. Jonesia triandra, *Roxb. Fl. Ind.* ii. 220. J. scandens, *Roxb. loc. cit.?*

TENASSERIM, MALACCA.—DISTRIB. Siam, Sumatra.

Petiolules $\frac{1}{8}$–$\frac{1}{4}$ in.; leaflets oblanceolate-oblong, subcoriaceous, subobtuse or subacute; upper $\frac{3}{4}$–1 ft. long. *Corymbs* sessile from the side of slender branches, round, very dense, sometimes 6–8 in. broad; bracts persistent, spreading or reflexed; bracteoles obovate, under $\frac{1}{4}$ in. long, not boat-shaped or amplexicaul, bright-coloured. *Sepals* under $\frac{1}{4}$ in. long. *Filaments* 3–4 times as long as the sepals. *Pod* oblong, 5–6 in. by $1\frac{1}{2}$–2 in.—Very near the Malay *S. macroptera* and *palembanica*, Miquel.

110. AMHERSTIA, Wall.

An erect tree. *Leaves* abruptly pinnate. *Flowers* racemed. *Calyx* with a long cylindrical disciferous tube; sepals 4, oblong, the two lowest connate. *Petals* only 3 developed, the upper very broad, with a long claw, the two lateral as long, but narrower, oblong-spathulate, the two lowest rudimentary. *Stamens* diadelphous, 9 lower having the filaments connate in a long tube, alternately larger and smaller, the upper free from the base; anthers versatile, dehiscing longitudinally. *Ovary* stalked beyond the disk, many-ovuled; style long, filiform, stigma capitate. *Pod* large, flat, almost woody, dehiscent. *Seeds* large, round-oblong, compressed, exalbuminous.—DISTRIB. A single endemic species.

1. **A. nobilis,** *Wall. Pl. As. Rar.* i. p. 1, t. 1–2; *Wall. Cat.* 596; *G. Don Gen. Syst.* ii. 437.

MARTABAN, TENASSERIM and MALACCA, often planted.

An erect unarmed tree. *Leaves* very large, abruptly pinnate; leaflets oblong, acuminate, $\frac{1}{2}$–1 ft., opposite, glabrous, subcoriaceous. *Flowers* in ample pendulous

racemes, the most showy of those of the Indian Leguminosæ; pedicels 2–4 in., with a pair of large lanceolate persistent coloured bracteoles at the apex enclosing the buds. *Sepals* membranous, coloured, 1 in. long. *Petals* mixed brilliant red and yellow, the upper one 2 in. long and broad; tube as long as the sepals, cylindrical. *Pod* like that of a *Millettia*, ½ ft. long, 1½ in. broad, glabrous, truncate, 4–6-seeded.

111. **TAMARINDUS,** Linn.

A spineless tree. *Leaves* abruptly pinnate. *Flowers* racemed. *Calyx*-tube turbinate; disk produced some distance above its base; teeth lanceolate, much imbricated, the two lowest connate. *Petals* only the three upper developed, the two lateral ovate, the upper hooded, the two lower reduced to scales. *Stamens* monadelphous, only 3 developed, the others reduced to mere bristles at the top of the sheath; anthers oblong, versatile, dehiscing longitudinally. *Ovary* many-ovuled, with a stalk adnate to the calyx-tube; style filiform, stigma capitate. *Pod* ligulate, many-seeded, with a thin crustaceous epicarp and thick pulpy mesocarp. *Seeds* exalbuminous.—A single species.

1. **T. indica,** *Linn.*; *DC. Prodr.* ii. 488; *Roxb. Fl. Ind.* iii. 215; *Wall. Cat.* 5824; *W. & A. Prodr.* 285; *Dalz. & Gibs. Bomb. Fl.* 82; *Bedd. Fl. Sylv.* t. 184. T. occidentalis, *Gaertn.*; *DC. loc. cit.* T. officinalis, *Hook. Bot. Mag.* t. 4563.

Diffused through India and the Tropics generally, probably indigenous in Africa.

A large unarmed tree. *Leaves* abruptly pinnate, with 20–40, glabrescent, close obtuse opposite oblong leaflets. *Flowers* few together, in copious lax racemes at the end of the branchlets; pedicels articulated at the base of the calyx; bracts boat-shaped, enclosing the buds, caducous. *Petals* under ½ in. long, yellow, striped with red. *Pod* 3–6 in. by 1 in. or more, 3–10-seeded.

112. **HUMBOLDTIA,** Vahl.

Unarmed erect small trees. *Leaves* abruptly pinnate, with persistent usually peltate stipules. *Flowers* small, in copious racemes, each furnished with a pair of persistent coloured bracteoles at the base. *Calyx*-tube turbinate, with the disk produced some distance above its base; sepals 4, oblong, subequal, imbricated. *Petals* 5 or 3, oblong-spathulate, clawed, subequal, exceeding the calyx. *Stamens* 5, equal, exserted, alternating with 5 minute staminodes, filaments filiform; anthers oblong, versatile, dehiscing longitudinally. *Ovary* with a stalk immersed in the disk, linear, few-ovuled; style very long, filiform, stigma terminal. *Pod* flat, dehiscent, rigidly coriaceous. *Seeds* exalbuminous.—DISTRIB. Species 5, the other Tropical African.

1. **H. laurifolia,** *Vahl*; *DC. Prodr.* ii. 488; branches hollow, nodes constricted, stipule-spur lanceolate, leaves nearly sessile, leaflets 8–10, petiolules short, petals 5. *R. Br. in Wall. Pl. As. Rar.* iii. 18; *W. & A. Prodr.* 285; *Wight Ic.* t. 1605; *Bedd. Fl. Sylv.* 93. Batschia laurifolia, *Vahl, Symb.* 39, t. 56.

MALABAR and CEYLON.

A low tree, with the internodes of the branchlets conspicuously swollen. *Leaves* ½–1 ft. long; leaflets oblong, cuspidate, rigidly subcoriaceous, glabrous, 3–4 in. long; stipules coriaceous, very large, oblong-lanceolate, 1 in. or more long above the attachment. *Racemes* dense, axillary, drooping, nearly sessile, 3–6 in. long; pedicels ⅛–¼ in. *Flower* ⅜ in. long, exclusive of the exserted stamens; bracteoles oblong-spathulate, half as long as the calyx. *Pod* rigid, ligulate-oblong, 3–4 in. long. *Seeds* 3–4.

2. **H. unijuga,** *Bedd. Ic. Pl. Ind. Or.* t. 108; branches solid, nodes not constricted, stipules not spurred, leaves and 2 leaflets subsessile, petals 5.

TRAVANCORE mountains, alt. 3–4500 ft., *Beddome.*

A large tree, glabrous in all its parts, with terete slender branchlets. *Stipules* lanceolate, $\frac{1}{4}$ in., rigidly coriaceous; petiole very short, broadly flattened and hollowed out on the face; leaflets oblong-lanceolate, rather oblique, 5–6 in. long, obtusely acuminate, glossy on the upper surface. *Pedicels* $\frac{1}{4}$–$\frac{1}{3}$ in., spreading, finely silky; bracteoles obtuse, half as long as the calyx. *Flower* $\frac{3}{4}$ in. long, exclusive of the exserted stamens. *Petals* bright red.

3. **H. Brunonis,** *Wall. Pl. As. Rar.* iii. 17, t. 233; branches solid, nodes not constricted, spur of stipules rounded, leaves nearly sessile, leaflets 4, petiolules short, petals 3. *Wall. Cat.* 2332; *W. & A. Prodr.* 285; *Wight Ic.* t. 1606; *Bedd. Fl. Sylv.* 93.

Ghauts of NILGHIRIS and COORG.

Branchlets slender, terete. *Petiole* not flattened; stipules small, lanceolate above the attachment, with a transverse oblong spur; leaflets oblong, rigidly subcoriaceous, glabrous, obtusely cuspidate, 4–6 in. long. *Racemes* axillary, distinctly peduncled, equalling or exceeding the leaves; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in., spreading or ascending; bracteoles and calyx grey-downy. *Flower* $\frac{1}{4}$–$\frac{3}{8}$ in. long, exclusive of the exserted stamens.

4. **H. Vahliana,** *Wight Ic.* t. 1607–8; branches solid, nodes not constricted, spur of stipules rounded, leaves distinctly petioled, leaflets 6–8, petiolules long, petals 5. *Bedd. Fl. Sylv.* 93.

NILGHIRIS; jungles about Conoor, *Dr. Wight.*

Branchlets slender, terete. *Stipules* 1 in. or more long, lanceolate above, transversely oblong below the point of attachment; leaf-rachis 5–7 in. long, including the 1 in. petiole; leaflets oblong-lanceolate, acuminate, glabrous, rigidly coriaceous, 5–6 in. long, both sides finely venulose. *Racemes* peduncled, subspicate, 1–3-nate; bracteoles and sepals very downy on the back, the latter $\frac{3}{8}$ in. long. *Petals* very caducous, not exceeding the sepals. *Pod* almost woody, $\frac{1}{2}$ ft. by $1\frac{1}{2}$ in., narrowed to the point.

113. AFZELIA, Smith.

Erect unarmed trees. *Leaves* abruptly pinnate, with few pairs of opposite leaflets. *Flowers* in copious terminal panicles. *Calyx* with the disk produced to the top of its elongated tube; sepals 4, much imbricated, slightly unequal. Developed *petal* one, orbicular with a distinct claw, the others absent or rudimentary. *Stamens* 3–9, declinate, filaments long, pilose; anthers minute, oblong, opening longitudinally. *Pod* large, oblong, flattish, sublignose, subindehiscent.—DISTRIB. Tropics of the Old World; species 10.

1. **A. retusa,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 73; leaflets 2–6, racemes simple, pedicels glabrous, calyx-tube as long as limb, fertile stamens 3.

MALACCA, *Griffith.* ANDAMANS, *Kurz.*

A shrub, glabrous in all its parts. *Leaflets* stalked, oblong, subcoriaceous, 2–3 in. long, obtuse, conspicuously emarginate. *Flowers* in simple corymbose terminal racemes; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. *Calyx*-tube $\frac{1}{4}$–$\frac{3}{8}$ in., cylindrical; sepals $\frac{1}{6}$ in. broad. *Petal* twice as long as the sepals; blade round, $\frac{1}{2}$ in. broad. *Pod* oblong, subcoriaceous, 3–4 in. by 1–$1\frac{1}{4}$ in.

2. **A. bijuga,** *A. Gray Bot. Amer. Expl. Expedit.* 467, t. 51; leaflets 4, panicle corymbose, pedicels pilose, calyx-tube as long as limb, fertile stamens 3.

Outea bijuga, *DC. Prodr.* ii. 511; *Wall. Cat.* No. 5823. Macrolobium bijugum, *Coleb. in Trans. Linn. Soc.* xii. 359, t. 17.

MALAY peninsula, *Wallich, Griffith.*—DISTRIB. Seychelles and Malay isles and Polynesia.

An erect tree, 50 feet high. *Leaflets* stalked, obliquely oblong, subcoriaceous, glabrous, 2–5 in. long, subacute or obtuse. *Flowers* in a dense terminal corymbose panicle; pedicels $\frac{1}{12}$–$\frac{1}{2}$ in., grey-downy. *Calyx*-tube cylindrical, $\frac{1}{4}$–$\frac{3}{8}$ in. *Petal* exserted, round, with a long claw. *Filaments* above 1 in. *Pod* rigid, flat, oblong, 6–8 in. long; seeds 4–5.

3. **A. palembanica,** *Baker*; leaflets 6–8, panicle corymbose, calyx-tube as long as limb, fertile stamens 3. Intsia palembanica, *Miq. Flor. Ind. Bat. Suppl.* 289.

MALACCA, *Griffith* ("The best Malacca timber tree"), *Maingay.* ANDAMANS, *Kurz.*—DISTRIB. Malay isles.

A tall unarmed erect tree. *Leaflets* stalked, oblong, subcoriaceous, obtuse, emarginate, 2–4 in. long; lowest pair distinctly smallest. *Flowers* in a dense terminal corymbose panicle; pedicels $\frac{1}{12}$–$\frac{1}{4}$ in., grey-downy. *Calyx*-tube cylindrical, $\frac{1}{8}$–$\frac{1}{6}$ in. *Petal* not exserted. *Filaments* $\frac{1}{2}$–1 in. *Pod* oblong, almost woody, glossy, 6–10 in. by 3 in., straight or rather curved.

4. **A.? coriacea,** *Baker*; leaflets 4–6, panicle thyrsoid with racemose branches, calyx-tube much shorter than the limb, fertile stamens 9. Intsia coriacea, *Maingay MSS.*

MALACCA, *Maingay.*

Leaflets stalked, oblong, glabrous, very rigid and coriaceous, 3–4 in. long, obtuse, emarginate. *Flowers* in copious elongated terminal panicles, with distant racemose branches, clothed like the pedicels and calyx with thin rusty tomentum. *Calyx*-tube very short; sepals $\frac{1}{6}$ in., much narrower and less imbricated than in the two other species. "*Filaments* alternately longer and shorter (5 long, 4 short), in bud, connate into a partial tube at the base," Maingay. *Pod* not seen.—May prove a *Pahudia,* but we have young buds only.

114. BAUHINIA, Linn.

Unarmed erect trees or climbers with circinate tendrils. *Leaves* simple, usually deeply cleft from the tip, rarely entire or fully divided into 2 leaflets. *Flowers* showy, in copious simple or panicled often corymbose racemes. *Calyx*-tube with the disk produced to the top, sometimes long and cylindrieal, sometimes short and turbinate; limb entire and spathaceous, or cleft into 2 or 5 teeth. *Petals* 5, subequal, usually with a distinct claw. *Stamens* 10, or reduced to 5 or 3, if fewer than 10 with sterile filaments absent or present, filaments free, filiform; anthers versatile, dehiscing longitudinally. *Ovary* stalked, many-ovuled; style long or short, stigma small or large and peltate, subterminal or oblique. *Pod* linear or rarely oblong, flat, continuous within, dehiscent or indehiscent. *Seeds* albuminous.—DISTRIB. Species 130, spread everywhere in the Tropics.

SECT. 1. **Pauletia,** Cav. Fertile *stamens* 10. *Calyx* with a very short tube and spathaceous limb. *Pod* narrow, dehiscent.—Erect shrubs with large showy flowers and connate leaflets.

1. **B. tomentosa,** *Linn.*; *DC. Prodr.* ii. 514; flowers usually in axillary pairs, petals much longer than the entire calyx-limb, pod stalked not ribbed near the upper suture. *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 323; *Wall. Cat.* 5790, *excl. F & G*; *Bot. Mag.* t. 5560; *W. & A. Prodr.* 295; *Bedd. Fl. Sylv.* 92. B. speciosa, *Roxb.*; *Wall. Cat.* 5791.

NORTH WEST Provinces to CEYLON and PENANG.—DISTRIB. Malay isles, China, Trop. Africa.

An erect shrub, with downy branches. *Leaf* broader than long, not cordate, coriaceous, 1–2 in. deep, cleft less than half way down into two obtuse lobes, pubescent below, 7-nerved. *Flowers* usually in short-peduncled pairs from the axils of the leaves, rarely 1 or 3; pedicels with a pair of large persistent linear bracteoles. *Calyx*-limb broad-ovate, finely downy, $\frac{1}{2}$ in. *Petals* $1\frac{1}{2}$–2 in. long, obovate-spathulate, yellow, the upper with a red blotch on the face. *Style* $\frac{1}{2}$–$\frac{5}{8}$ in. *Pod* distinctly stalked, 4–5 in. by $\frac{1}{2}$–$\frac{5}{8}$ in., 6–10-seeded, glabrous.

2. **B. brachycarpa,** *Wall. Cat.* 5786; flowers racemose, pod small sessile not ribbed near the upper suture. *Benth. Pl. Jungh.* 261.

AVA; Taong-dong mountains, *Wallich.*

A doubtful plant, known only in fruit. *Branches* slender, glabrous. *Leaf* cordate, roundish, thin, glabrous, 9-ribbed, cleft a third down into two obtuse lobes. *Racemes* short-peduncled, many-flowered, about as long as the leaves; pedicels ascending, $\frac{1}{4}$–$\frac{1}{3}$ in. *Pod* $1\frac{1}{4}$–$1\frac{1}{2}$ in. by $\frac{3}{8}$ in., narrowed to both ends, 2–3-seeded, dehiscent.

3. **B. polycarpa,** *Wall. Cat.* 5787; flowers in long racemes, calyx-limb entire, pod nearly sessile not ribbed near the upper suture. *Benth. Pl. Jungh.* 261.

MARTABAN; banks of the Attran river, *Wallich.*

Another doubtful species, known only in bud and pod. *Leaves* suborbicular, slightly cordate, 3–4 in. long, glabrous, flexible, obtusely lobed $\frac{1}{3}$–$\frac{1}{4}$ down. *Flowers* in narrow close short-peduncled axillary regular racemes 3–5 in. long. *Pedicels* shorter than the bud, which is glabrous, ovoid-lanceolate, $\frac{1}{4}$ in. long. *Pod* 3–4 in. long, $\frac{3}{8}$ in. broad, glabrous, dehiscent, nearly straight, 6–10-seeded.

4. **B. acuminata,** *Linn.*; *DC. Prodr.* ii. 513; flowers in close axillary racemes, petals as long as the calyx-limb which is cleft into 5 subulate teeth at the tip, pod with a rib on each side of the upper suture. *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 324; *Wall. Cat.* 5794; *W. & A. Prodr.* 295. B. purpurea, *Wall. Cat.* 5797, D. B. candida, *Ait.*; *DC. Prodr. loc. cit., non Roxb.*

NORTH WEST Provinces to CEYLON and MALACCA. — DISTRIB. China, Malay isles.

An erect shrub, with obscurely downy angular branches. *Leaves* slightly cordate, flexible, 3–6 in. long, 9–11-nerved, the lobes acute or subobtuse, not reaching half way down, at first finely pubescent beneath. *Racemes* axillary, short-peduncled, corymbose; pedicels erecto-patent, $\frac{1}{2}$–$\frac{3}{4}$ in. long, with linear-subulate bracts and bracteoles. *Calyx* 1–$1\frac{1}{4}$ in., narrowed into a long point, cleft at the tip. *Petals* oblong, whitish. *Style* $\frac{1}{2}$ in. *Pod* 4–5 in. long, $\frac{5}{8}$–$\frac{3}{4}$ in. broad, firm, glabrous, 8–12-seeded; stalk $\frac{1}{2}$ in. long.

SECT. 2. **Pileostigma,** Hochst. Fertile *stamens* 10. *Calyx* with a short tube and spathaceous or 5-cleft limb. *Pod* narrow, indehiscent.—Erect shrubs, or climbers with small flowers and connate leaflets.

5. **B. racemosa,** *Lam. Dict.* i. 390; erect, leaves small deeply cleft 7–9-nerved, flowers in lax simple racemes, calyx-limb entire, stigma sessile. *W. & A. Prodr.* 295; *Hook. Ic.* t. 141; *Dalz. & Gibs. Bomb. Fl.* 82; *Bedd. Fl. Sylv.* t. 182, *non Vahl.* B. parviflora, *Vahl*; *DC. Prodr.* ii. 514; *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 323. B. spicata, *Koenig*; *Wall. Cat.* 5789. B. timoriensis, *Decaisne in Nov. Ann. Mus.* iii. 466. Pileostigma racemosa, *Benth. Pl. Jungh.* 262.

PUNJAB and GARWHAL to CEYLON and PEGU.—DISTRIB. China, Malay isles, Timor.

A small crooked bushy tree with drooping branches. *Leaves* broader than long, rigidly coriaceous, 1½–2 in. long, slightly cordate, clothed more or less densely beneath with grey pubescence. *Racemes* short-peduncled, lax, terminal and leaf-opposed, ¼–⅓ ft. long, with densely grey-downy rachises; pedicels ⅛–¼ in., erecto-patent. *Calyx*-tube turbinate, not more than $\frac{1}{12}$ in. long; limb ¼–⅓ in., not splitting up. *Petals* oblanceolate, yellow, as long as the limb. *Pod* ½–1 ft. by ½–1 in., not venulose, falcate, firm, glabrous, turgid; stalk above an inch long. *Seeds* 12–20.

B. RUFESCENS, Lam.; DC. Prodr. ii. 514, which is sometimes cultivated, differs from this by its very small leaves, seldom over half an inch deep, short style, and much smaller pod. It is a native of Tropical Africa.

6. **B. malabarica,** *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 321; erect, leaves 7-9-nerved slightly cordate deeply bifid, flowers in short mostly simple corymbs, bracts minute, lower pedicels 1½–2 the calyx, calyx-limb 5-cleft, style produced. *Wall. Cat.* 5793; *W. & A. Prodr.* 294; *Dalz. & Gibs. Bomb. Fl.* 82; *Bedd. Fl. Sylv.* 92. B. tomentosa, *Wall. Cat.* 5790 *F & G.* Pileostigma malabarica, *Benth. Pl. Jungh.* 261.

Western and Central Himalayas (ascending to 1000 ft. in KUMAON and 4000 feet in BEHAR) through India proper and to BIRMA.—DISTRIB. *B. acida*, Reinw. (*B. purpurea* DC. of Malay isles and Timor scarcely more than a variety.)

An erect low bushy tree. *Leaves* broader than long, rigidly coriaceous, the same shape as in the last, but longer, with two obtuse lobes reaching about a quarter down, glaucous, subglabrous or finely grey-downy beneath. *Racemes* sessile, dense, axillary, as broad as long; pedicels ascending, very slender, ½–1 in. long. *Calyx* clothed with pale brown down; tube cylindrical, turbinate, ⅛–⅙ in.; limb ¼ in. *Petals* oblong-spathulate, little exserted. *Pod* 1 ft. by ¾–1 in., nearly straight, firm, glabrous, rather turgid, reticulato-venulose, rostrate with the style, 20–30-seeded; stalk 1 in. long.

VAR. *reniformis*, Royle MSS., sp.; leaves as small as those of *B. racemosa*, densely pubescent beneath.—North-west provinces.

7. **B. unguiculata,** *Baker*; erect, leaves 7-nerved cordate deeply bifid, flowers in short simple corymbs, bracts large, pedicels 3–4 times the calyx, calyx-limb 5-cleft, style produced.

SIAM, *Sir R. Schomburgk.*

Closely allied to the last. *Leaves* broader than long, rigidly subcoriaceous, 2–3 in. long, glabrous beneath, with two obtuse lobes reaching ¼–⅓ down. *Racemes* short-peduncled, as long as the leaves; bracts under ¼ in., oblanceolate, reflexed; pedicels slender, lower 1½–2 in. *Calyx* thinly grey-downy externally; tube cylindrical, turbinate, ⅛–⅙ in.; limb ¼–⅓ in. *Petals* ½ in., pilose, with a round limb equalling a distinct claw. *Ovary* downy, with a distinct stalk and style. *Pod* unknown.

8. **B. Lawii,** *Benth. MSS.*; scandent, leaves deeply cordate shortly bifid 15–17-nerved, racemes dense forming ample terminal panicles with reflexed branches, calyx-limb shortly 5-cleft, stigma sessile. ? B. foveolata, *Dalz. in Journ. Linn. Soc.* 13, p. 188.

CONCAN, *Law.*

Branchlets slender, terete, ecirrhose, thinly grey-downy. *Leaves* orbicular, rigidly coriaceous, 4–9 in. long and broad, finely downy, the numerous ribs thick and much raised on the under surface. *Racemes* forming an ample deltoid panicle ½ ft. long and broad, with numerous deflexed densely pale-brown downy branches, the lower compound; bracts deltoid, minute; pedicels erecto-patent, very short. *Calyx*-tube ⅛–⅙ in., narrow, turbinate; limb ¼–⅓ in., shortly 5-cleft. *Petals* twice the calyx. *Stigma* large, peltate, ⅛ in. broad. *Pod* unknown.—Agrees with the description of Dalzell's plant except that it is not diœcious.

SECT. 3. **Lysiphyllum,** *Benth.* Fertile *stamens* 10. *Calyx* with a long tube and 5-cleft limb. *Pod* broad, indehiscent.—Leaflets distinct.

9. **B. Blancoi,** *Baker*; ecirrhose, corymbs equalling the leaves, flowers small, tube equalling the ovoid bud. Phanera Blancoi, *Benth. Pl. Jungh.* 264.

Siam, *Sir R. Schomburgk.*—Distrib. Philippines, *Cuming,* 1518.

A glabrous erect shrub. *Leaflets* 1½ in., rigidly subcoriaceous, obtuse, finely veined, deeply rounded below the point of insertion. *Flowers* in dense axillary corymbs; pedicels ¼ in., erecto-patent. *Calyx*-tube cylindrical, ¼–⅜ in., finely velvety; sepals lanceolate, equalling the tube. *Petals* much exserted, oblong-spathulate, coarsely pubescent. *Pod* distinctly stalked, glabrous, 5–6 in. by 1–1¼ in., 8–10-seeded.

10. **B. diphylla,** *Hamilt. in Symes It. Avens.* t. 24; cirrhose, racemes much exceeding leaves, flowers large, tube much shorter than the lanceolate bud. *Wall. Cat.* 5784. B. Buchanani, *Desv. in Ann. Sc. Nat. Hist. Par. ser.* i. *vol.* ix. 430. Phanera diphylla, *Benth. Pl. Jungh.* 264.

Concan, *Stocks.* Birma, *Wallich, Maingay.* Malacca, *Griffith.*

A glabrous twiner, with circinate tendrils. *Leaflets* rigidly coriaceous, 2–3 in. long, rounded at both ends. *Flowers* in lax axillary racemes, with rusty-downy branches; pedicels ascending, 1½ in. *Calyx*-tube 1 in. long, narrow turbinate; sepals lanceolate, coriaceous, 1–1½ in. *Petals* rather exserted, oblong, with a long claw. *Pod* ¾–1 ft. by 1½–2 in., thin, glabrous, indehiscent, many-seeded down the centre; stalk finally 1½–2 in. long.

Sect. 4. **Phanera,** *Lour.* Fertile *stamens* usually 3, sometimes 4–5. *Calyx*-tube mostly produced; limb usually 5-cleft, sometimes spathaceous.—Erect or scandent; flowers large or small.

* *Leaves narrowed gradually or suddenly to an entire point.*

11. **B. cornifolia,** *Baker*; leaf half as long again as broad gradually pointed, calyx-tube 3–4 times as long as the limb, petals oblanceolate-oblong not clawed.

Penang, *Griffith.*

Branches slender, glabrous, without tendrils, thinly rusty-downy. *Leaves* 2–3 in., rigidly subcoriaceous, slightly cordate, 5-nerved, thinly brown-silky beneath; petiole 1 in. *Flowers* in dense terminal corymbose racemes, 3 in. long and broad; pedicels erecto-patent, lower above 1 in. long. *Calyx* thinly rusty-downy externally; tube cylindrical, ½–⅝ in. long; bud ovoid, under ¼ in. *Petals* more than twice the length of the calyx-limb. *Ovary* downy, with a short distinct style and stalk; stigma large, peltate.

12. **B. Finlaysoniana,** *Grah. in Wall. Cat.* 5801; leaf once and a half to twice as long as broad gradually pointed, calyx-limb as long as the tube, petals orbicular with a distinct claw. Phanera Finlaysoniana, *Benth. Pl. Jungh.* 262.

Malay Peninsula, *Finlayson.*

Branchlets slender, glabrescent, without tendrils. *Leaves* 3–4 in. long, rigidly coriaceous, glabrous, shortly cordate, 3–5-nerved, narrowed gradually from the middle to a point; petiole very short. *Racemes* terminal and axillary, close, 3–4 in. long, the rachis thinly rusty-downy; pedicels ½ in. *Calyx*-tube ¼ in., cylindrical. *Bud* ovoid. *Petals* ½–⅝ in. long, glabrous. *Ovary* rusty; style and stalk both very short.

13. **B. emarginata,** *Jack. in Mal. Misc.* i. 75; *Comp. Bot. Mag.* i. 223; leaf rather longer than broad suddenly obtusely pointed, calyx-limb as long as the tube, petals orbicular with a distinct claw. B. lucida, *Wall. Cat.* 5779 A. B. cordifolia, *Roxb. Fl. Ind.* ii. 332? Phanera lucida, *Benth. Pl. Jungh.* 262.

Penang, *Porter.*—Distrib. Sumatra.

A cirrhose twiner, with glabrescent branches. *Leaves* rigidly coriaceous, glabrous,

3–5 in. long, 5–7-nerved, distinctly cordate. *Flowers* in copious peduncled terminal racemes 3–4 in. long; pedicels erecto-patent, lower 1 in. or more long, like the calyx densely brown-downy. *Calyx*-tube between cylindrical and turbinate, $\frac{1}{8}$–$\frac{1}{6}$ in.; bud obovoid. *Petals* twice the length of the calyx, densely silky on the outside. *Ovary* downy, with a short distinct style.

** *Leaves round-cordate, cleft only at the very tip.*

14. **B. retusa,** *Ham.*; *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 322; erect, ecirrhose, pubescence grey, calyx-tube turbinate very short. B. emarginata, *Wall. Cat.* 5792, *non Jack.* Phanera retusa, *Benth. Pl. Jungh.* 263.

Western Himalayas; SIMLA, GURWHAL, KUMAON, ascending to 4000 ft.

Leaves rigidly coriaceous, rather broader than long, 4–6 in. long, 9-nerved, glabrous beneath, usually deeply cordate. *Flowers* in ample terminal panicles, sometimes a foot long and broad, with corymbose branches clothed with fine grey silky pubescence, the lower springing from the axils of reduced leaves; lower pedicels ascending, $\frac{1}{2}$–$\frac{3}{4}$ in. long; bracts and bracteoles minute, caducous. *Calyx*-tube scarcely any; limb $\frac{1}{6}$ in. long, irregularly cleft; bud ovoid. *Petals* oblong, clawed, twice the sepals, yellow. *Style* produced, stigma large. *Pod* hard, flat, 5–6 in. by $1\frac{1}{4}$–$1\frac{1}{2}$ in., glabrous, late in dehiscing, short-stalked, 6–8-seeded.

15. **B. integrifolia,** *Roxb. Fl. Ind.* ii. 331; scandent, cirrhose, pubescence ferruginous, calyx-tube cylindrical not exceeding the limb, ovary densely silky short-stalked. *Wall. Cat.* 5780. Phanera integrifolia, *Benth. Pl. Jungh.* 263.

PENANG and MALACCA.

Leaves rigidly subcoriaceous, glabrous, 9-nerved, deeply cordate, 3–6 in. long, with a deltoid apical sinus. *Inflorescence* as in the last, a long panicle with very dense many-flowered ascending racemose branches, clothed like the calyx with bright rusty silky pubescence; bracts small, lanceolate, subpersistent; pedicels ascending, lower $\frac{1}{2}$–$\frac{3}{4}$ in. *Calyx*-tube $\frac{1}{8}$–$\frac{1}{6}$ in.; sepals deltoid; bud globose. *Petals* obovate, clawed, twice the sepals, densely rusty-silky. *Style* long; stigma small. *Pod* oblong, hard, flat, short-stalked, 5–6 in. by 2 in., late in dehiscing.

16. **B. bidentata,** *Jack in Mal. Misc.* i. 76; *Hook. Comp. Bot. Mag.* i. 223; scandent, cirrhose, pubescence ferruginous, calyx-tube cylindrical exceeding the limb, ovary usually subglabrous long-stalked. *Wall. Cat.* 5778. Phanera bidentata, *Benth. Pl. Jungh.* 263.

PENANG and MALACCA.—DISTRIB. Philippines.

Very near *B. integrifolia*, with which it agrees in leaf, vestiture and inflorescence. Lower *pedicels* 1–2 in. long; bracts caducous. *Calyx*-tube cylindrical, $\frac{3}{8}$–$\frac{3}{4}$ in. *Bud* broad-ovoid or subglobose. *Calyx*-limb under $\frac{1}{4}$ in., slit down to the base. *Petals* 2–3 times the length of the sepals, obovate, clawed, more or less silky. *Style* long; stigma large, peltate. *Pod* unknown.

*** *Leaves deeply cleft, persistently pubescent beneath.*

17. **B. Vahlii,** *W. & A. Prodr.* 297; cirrhose, pubescence dense grey or ferruginous, leaf-lobes obtuse, pedicels long, calyx-tube cylindrical, petals much exserted densely pilose. *Dalz. & Gibs. Bomb. Fl.* 83. B. racemosa, *Vahl, Symb.* t. 62; *DC. Prodr.* ii. 515; *Roxb. Fl. Ind.* ii. 325; *Wall. Cat.* 5775, *non Lam.* Phanera Vahlii, *Benth. Pl. Jungh.* 263.

Foot of the CENTRAL and EAST HIMALAYAS, ascending to 2500 feet in Kumaon. BEHAR, *Dr. Hooker*. CONCAN, *Stocks*. CIRCARS, *Roxburgh*.

An enormous climber, with densely pubescent branchlets and abundant circinate tendrils. *Leaves* rigidly subcoriaceous, rather broader than long ($\frac{1}{4}$–$1\frac{1}{2}$ ft.), deeply

cordate, 11–13-nerved, slit ⅓–¼ down with an open sinus, persistently downy all over beneath. *Racemes* long-peduncled, terminal, dense, subcorymbose; lower pedicels 1–2 in., with persistent linear bracteoles. *Calyx*-tube slender, ¼–⅓ in.; limb under ½ in., splitting into two lobes. *Petals* 1 in. long, obovate, with a short claw. *Ovary* ferrugineo-tomentose, with a short stalk, long style and minute stigma. *Pod* sublignose, rusty-downy, ¾–1 ft. by 2 in., 8–12-seeded, finally splitting open.

18. **B. rosea,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 72; pubescence fulvous, leaf-lobes obtuse, pedicels long, calyx-tube short, petals much exserted slightly pilose.

MARTABAN, *Brandis.*
A climber, with pubescent branchlets. *Leaves* round-cordate, 3–5 in. each way, chartaceous, slit ⅓ down, glabrescent above, clothed with persistent fulvous pubescence beneath. *Racemes* terminal, corymbose; pedicels 1½–2 in.; bracts linear-lanceolate, acuminate, ⅓ in. *Calyx*-teeth linear-lanceolate, ⅓ in., free and reflexed when mature. *Petals* ¾ in., with a long claw and linear-obovate undulated blade. *Ovary* fulvo-villose; style thick, shorter than the ovary. *Pod* unknown. *Ex Kurz, loc. cit.*

19. **B. rufa,** *Grah. in Wall. Cat.* 5798; cirrhose, pubescence thin dark ferruginous, leaf-lobes acute, pedicels long, tube slender cylindrical, petals much exserted densely silky. Phanera rufa, *Benth. Pl. Jungh.* 263.

SILHET, *Wallich.*
Branches, petioles, leaf-ribs beneath, pedicels and calyx densely ferrugineo-tomentose. *Leaves* rigidly subcoriaceous, 4–6 in. long, deeply cordate, 11–13-nerved, with a deltoid sinus reaching ¼ down and deltoid lobes. *Corymb* dense, terminal, subsessile; pedicels 1½–2 in., more slender than in *B. Vahlii.* *Calyx*-tube ¼–⅓ in.; limb equalling the tube, membranous, irregularly slit. *Petals* oblong-spathulate, twice the length of the calyx-limb, densely silky on the back. *Ovary* densely silky, with a short stalk and long style, stigma small. *Pod* unknown.

20. **B. velutina,** *Wall. Cat.* 5781; ecirrhose, pubescence thin grey puberulent, leaf-lobes obtuse, pedicels very short, tube cylindrical, petals little exserted obovate with a very long pilose claw. Phanera velutina, *Benth. Pl. Jungh.* 262.

TENASSERIM, *Wallich, Griffith, Helfer.*
Habit and inflorescence of *B. purpurea* and *variegata.* *Leaves* broader than long, rigidly coriaceous, pale green, deeply cordate, 9–11-nerved, with an open sinus reaching ½–⅓ down. *Racemes* few-flowered, short-peduncled, axillary, corymbose; pedicels ⅕–⅛ in.; bracts deltoid, very minute. *Calyx* thinly grey-pubescent; tube ¾–1 in.; sepals distinct, lanceolate, as long as the tube. Claw of the *petals* three times as long as the limb. *Ovary* grey-tomentose, narrowed gradually into a long stalk and style, stigma small. *Pod* unknown.

21. **B. semibifida,** *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 330; ecirrhose, pubescence thin dark ferruginous, leaf-lobes obtuse, pedicels elongated, calyx-tube stout ampullæform, petals oblanceolate glabrous little exserted. *Wall. Pl. As. Rar.* t. 253; *Cat.* 5783; *Wight. Ic.* t. 263. Phanera semibifida, *Benth. Pl. Jungh.* 263.

MALACCA, *Griffith.* TENASSERIM, *Helfer.*
Branchlets, leaf-ribs beneath, pedicels and calyx clothed with bright ferruginous silky pubescence. *Leaves* rigidly subcoriaceous, 2–3 in. long, deeply cordate, 11-nerved. *Racemes* terminal, subsessile, 3–4 in. long; pedicels 1–1½ in. *Calyx*-tube ½ in., narrowed from the base towards the neck; sepals lanceolate, distinct, coriaceous, reflexed, as long as the tube. *Ovary* densely silky, distinctly stalked, with a short thick style and large peltate stigma.—Closely allied to *B. ferruginea.*

22. **B. elongata,** *Korthals in Nat. Verh. Bot.* 89. t. 24; ecirrhose, pubescence thin dark ferruginous, leaf-lobes obtuse, pedicels short, calyx-tube cylindrical, petals oblanceolate glabrous little exserted. B. mollissima, *Wall. Cat.* 5782. Phanera elongata, *Benth. Pl. Jungh.* 262.

PENANG, *Wallich.* BIRMA, *Maingay.*—DISTRIB. Malay isles.

Branchlets, pedicels and calyx clothed persistently with fine ferruginous tomentum. *Leaves* rigidly subcoriaceous, deeply cordate, 11–13-nerved, 4–6 in. long, with an open sinus, reaching about $\frac{1}{4}$ down. *Corymbs* sessile, few-flowered, axillary; bracts small, lanceolate, subpersistent; pedicels erecto-patent, lower $\frac{1}{4}$–$\frac{1}{2}$ in. *Calyx*-tube slender, $\frac{3}{4}$–1 in.; sepals as long as the tube, distinct, lanceolate. *Petals* oblanceolate, clawed. *Ovary* tomentose, narrowed into a very long stalk and style, stigma small.

**** *Leaves deeply cleft, with acute or subacute lobes, nearly or quite glabrous beneath when mature.*

23. **B. ornata,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 72; ecirrhose, leaves 9–11-nerved, pubescence ferruginous, pedicels long, flowers small, calyx-tube short turbinate, sepals 5 rather exceeding the tube, petals slightly exserted.

PEGU, *Kurz.*

Branchlets clothed with deciduous bright ferruginous silky pubescence. *Leaves* deeply cordate, firm, membranous, reaching nearly a foot long, the acute contiguous lobes reaching half way down or more, the slender veins clothed at first with ferruginous hairs. *Flowers* in dense rounded peduncled simple terminal corymbs; bracts small, lanceolate, tomentose, persistent; pedicels slender, an inch long, clothed with short spreading hairs; lower deflexed. *Calyx* thinly silky; tube $\frac{1}{8}$ in.; limb reflexed, membranous, irregularly cleft. *Petals* $\frac{1}{8}$ in., oblong, clawed, silky on the back. *Stamens* 3. *Ovary* subsessile, densely rusty-silky; style $\frac{3}{8}$–$\frac{1}{2}$ in., stigma small pilose.

7315 24. **B. khasiana,** *Baker*, ecirrhose, leaves 9–11-nerved, pubescence dense bright ferruginous, pedicels long, calyx-tube cylindrical-turbinate, limb 5-cleft as long as the tube, petals slightly exserted.

KHASIA hills, alt. 1–3000 ft., *Hook. fil. & Thomson.*

A climber, with branchlets clothed with bright rusty silky pubescence. *Leaves* cordate, large, thin, glabrous, the divergent subacute lobes reaching about a third down. *Flowers* in numerous contiguous short-peduncled corymbs, forming a broad terminal corymbose panicle, the lower branches subtended by large leaves; pedicels ascending, 1–1$\frac{1}{2}$ in. long, like the calyx densely clothed with very bright rusty silky pubescence; bracts caducous. *Calyx*-tube $\frac{1}{4}$–$\frac{1}{3}$ in.; bud subglobose; limb irregularly cleft. *Petals* obovate, clawed, densely silky on the back. *Stamens* 3. *Ovary* short-stalked, densely rusty-silky; style short, stigma small.

25. **B. glabrifolia,** *Baker*; ecirrhose, leaves 9-nerved, pubescence thin grey, pedicels long, flowers small, calyx-tube turbinate, limb rather exceeding tube, petals little exserted. Phanera glabrifolia, *Benth. Pl. Jungh.* 263.

TENASSERIM, *Helfer*, and sent from the Calcutta gardens as *B. piperifolia.*

Branchlets slender, at first finely grey-silky. *Leaves* shallowly cordate, rigidly subcoriaceous, glabrous, shining above, moderately large, the acute lobes reaching $\frac{1}{6}$–$\frac{1}{4}$ down. *Flowers* in dense many-flowered, short-peduncled corymbs, forming a broad terminal corymbose panicle; bracts minute, lanceolate; pedicels slender, ascending; lower $\frac{3}{4}$–1 in., clothed like the calyx with adpressed grey silky pubescence. *Calyx*-tube $\frac{1}{8}$ in.; bud globose; limb not usually fully 5-cleft. *Petals* obovate, clawed, densely silky on the back. *Ovary* glabrous, short-stalked; style produced, stigma small.

26. **B. macrostachya,** *Wall. Cat.* 5774; cirrhose, leaves 9-nerved, pubescence thin grey, pedicels moderately long, calyx-tube turbinate very oblique,

sepals deltoid, petals much exserted. B. scandens, *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 326; *Wight Ic.* t. 264, *non Linn.* Phanera macrostachya, *Benth. Pl. Jungh.* 262.

SILHET, *Roxburgh, Wallich.* ASSAM, *Hamilton.*
Branches glabrous, with copious stalked geminate tendrils. *Leaves* round-cordate, rigidly subcoriaceous, subglabrous, 3–4 in. long, with an open deltoid sinus reaching $\frac{1}{6}$–$\frac{1}{4}$ down and deltoid subacute lobes. *Flowers* in forked or simple peduncled narrow sublax racemes $\frac{1}{4}$–$\frac{1}{2}$ ft. long; bracts minute, deltoid; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in., clothed like the calyx with fine grey silky pubescence. *Calyx*-tube $\frac{1}{4}$ in.; limb campanulate, $\frac{1}{8}$ in., regularly 5-cleft half-way down. *Petals* $\frac{1}{2}$ in., obovate, clawed, densely silky. *Ovary* densely ferrugineo-tomentose; stalk and style short. *Pod* ligulate, 4–6 in. by 2 in., flat, indehiscent, persistently tomentose, 2–4-seeded.

27. **B. divergens,** *Baker*; cirrhose, leaves 7-nerved, pubescence thin grey, pedicels very short, calyx-tube cylindrical, limb spathaceous entire as long as the tube, petals much exserted.

BIRMA, *Griffith.*
Stems slender, scandent, glabrescent. *Leaves* rigidly subcoriaceous, slightly cordate, glabrous, broader than long, 3–4 in. long, with a broadly rounded sinus reaching half way down and divergent deltoid acuminate lobes. *Racemes* copious, few-flowered, congested, sessile, axillary; pedicels scarcely any; bracts minute, deltoid. *Calyx*-tube $\frac{1}{2}$–$\frac{5}{8}$ in. long; limb tough, entire, $\frac{1}{2}$ in. broad. *Stamens* 5. *Petals* oblanceolate, three times as long as the limb, glabrous, not clawed. Immature *pod* narrow, $\frac{1}{2}$ ft. long, glabrous, with a long stalk.

28. **B. bracteata,** *Grah. in Wall. Cat.* 5802; cirrhose, leaves 9-11-nerved, pubescence grey, pedicels very long, bracteoles linear, calyx-tube short turbinate, limb exceeding the tube, petals much exserted. Phanera bracteata, *Benth. Pl. Jungh.* 264.

TENASSERIM, *Griffith, Helfer.* SIAMESE gulf, *Finlayson.*
Branchlets finely grey-downy, with copious stout circinate tendrils. *Leaves* rigidly coriaceous, slightly cordate, rather longer than broad, 4–6 in. long, glabrous, with a sinus reaching half way down, so narrow that the dimidiate deltoid subacute lobes touch each other. *Corymbs* many-flowered, short-peduncled, axillary, $\frac{1}{4}$–$\frac{1}{2}$ ft long; bracts large, lanceolate, persistent; pedicels ascending, slender, clothed like the calyx with fine grey pubescence, furnished with a pair of opposite linear bracteoles above the middle, the lower ones 2–3 in. long. *Calyx*-tube $\frac{1}{6}$–$\frac{1}{4}$ in.; sepals $\frac{3}{8}$–$\frac{1}{2}$ in., lanceolate, subconnate. *Petals* above 1 in. long, with a tomentose claw, exceeding the cordate crisped limb. *Ovary* grey-downy, with a long style and stalk, stigma small.

29. **B. involucellata,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 72; leaves 9–11-nerved, pubescence thin, pedicels very long, bracteoles large oblong, flowers large, calyx-limb as long as the tube, petals much exserted.

MARTABAN, *Dr. Brandis.*
A climbing shrub, with thinly puberulous young branches. *Leaves* thinly chartaceous, cordate-ovate, 3–4 in. long, glabrous, with a sinus reaching half-way down or more, the lobes narrowed to a subobtuse point. *Racemes* lax, terminal, glabrescent; pedicels 2–2$\frac{1}{2}$ in.; bracteoles oblong, subobtuse, $\frac{1}{2}$ in. long, velvety within. *Calyx* velvety; tube $\frac{1}{4}$ in. or more long; teeth lanceolate acuminate, finally free and reflexed. *Petals* pale rose, 1$\frac{1}{2}$ in. long, with an ovate-oblong obtuse blade as long as the claw. *Ovary* glabrous; style thick, moderately long. *Pod* unknown. *Ex Kurz loc. cit.*

***** *Leaves deeply cleft, with obtuse or rarely subacute lobes, nearly or quite glabrous beneath when mature.*

30. **B. glauca,** *Wall. Cat.* 5785; cirrhose, pubescence thin ferruginous, leaves 7–9-nerved cleft below the middle, pedicels moderately long, calyx-limb

2-valved much shorter than the cylindrical tube, petals glabrous exserted. Phanera glauca, *Benth. Pl. Jungh.* 265; *Miq. Fl. Ind. Bat.* i. 68, t. 2, A.

TENASSERIM, MARTABAN, PENANG.—DISTRIB. Malay isles, China.

Branchlets slender, soon glabrescent, with copious tendrils. *Leaves* the smallest and deepest cleft of the section, cordate, firm, 1–3 in. long, the ribs at first pilose, the apical lobes always obtuse. *Flowers* in copious dense short-peduncled or sessile terminal corymbs; pedicels slender, erecto-patent, $\frac{1}{2}$–1 in., with several setaceous persistent bracteoles. *Calyx*-tube $\frac{1}{2}$–$\frac{3}{4}$ in.; limb $\frac{1}{4}$ in., reflexed, thinly silky. Fertile *stamens* 3. *Ovary* glabrous, with a short stalk, moderately long style and small stigma. *Pod* thin, firm, indehiscent, glossy, 6–8 in. by $1\frac{3}{4}$–2 in., with 10–12 small seeds down the middle, like *B. diphylla*.—Only distinguishable from the Chinese *B. corymbosa*, Roxb.; Wall. Cat. 5388, by its broad indehiscent pod. A plant gathered by Hooker and Thomson in Khasia, without flower, has a pod like *B. glauca*, but the leaves are larger, thinner, and much less deeply cleft.

VAR. *parvifolia*, Teysm. & Binend. sp.; leaves very small $\frac{1}{4}$–$\frac{1}{3}$ in. long cleft nearly to base clothed beneath with fine ferruginous silky pubescence, corymbs few-flowered. SINGAPORE, *Dr. Oxley*.

31. **B. ferruginea,** *Roxb. Fl. Ind.* ii. 331; cirrhose, pubescence bright ferruginous, leaves 9–11-nerved not cleft down to the middle, pedicels long, calyx-limb 5-cleft rather exceeding the ampullæform tube, petals exserted densely silky. *Wall. Cat.* 5776; *Korth. in Nat. Verh. Bot.* t. 23. B. Pottsii, *G. Don Gen. Syst.* ii. 462. Phanera ferruginea, *Benth. Pl. Jungh.* 262.

PENANG, MALACCA, SINGAPORE.—DISTRIB. Malay isles.

Branchlets soon glabrescent, with a few stout woody tendrils. *Leaves* rigidly subcoriaceous, deeply cordate at both ends, 2–4 in. long, with the ribs at first rusty-pubescent. *Flowers* in ample terminal racemes, $\frac{1}{4}$–$\frac{1}{2}$ ft. long; pedicels erecto-patent, clothed like the calyx with bright rusty silky pubescence, $1\frac{1}{2}$–2 in. long; bracts minute, lanceolate, caducous. *Calyx*-tube $\frac{1}{2}$ in. long; sepals lanceolate, coriaceous, distinct. *Petals* oblanceolate, clawed. *Stamens* 3. *Ovary* densely rusty-silky, with a long stalk and style and very large oblique stigma. *Pod* smooth, thin, $\frac{1}{2}$ ft. long, $1\frac{1}{2}$ in. broad.

VAR. 1. *Griffithiana*, (Phanera Griffithiana, *Benth. Pl. Jungh.* 263), a form with large round persistent stipules.—Malacca, *Griffith, Maingay*.

VAR. 2. *excelsa*, (Phanera excelsa, *Blume*; *Miq. Fl. Ind. Bat.* i. 62); calyx-tube oblong $\frac{1}{2}$–$\frac{3}{4}$ in. long much stouter than in the type ($\frac{1}{4}$–$\frac{3}{8}$ in.), sepals above an inch long.—Malacca, *Griffith*. Distrib. Malay isles.

32. **B. nervosa,** *Wall. Cat.* 5777; cirrhose, pubescence thin ferruginous, leaves 11–15-nerved not lobed half-way down, pedicels long, calyx-limb 5-cleft as long as the cylindrical tube, petals silky exserted. Phanera nervosa, *Benth. Pl. Jungh.* 262.

SILHET, *Wallich*. ASSAM, *Griffith*. KHASIA Mts., 1–3000 ft., *Hook. fil. & Thomson*.

A robust climber, with thinly silky branchlets. *Leaves* rigidly subcoriaceous, deeply cordate, middle-sized, rather longer than broad, at first thinly silky on the ribs, the contiguous lobes sometimes subacute. *Flowers* in copious elongated terminal racemes, with branches clothed with bright rusty-silky pubescence; bracts lanceolate, silky, caducous; pedicels erecto-patent, lower $\frac{1}{2}$–2 in. long. *Calyx*-tube $\frac{1}{2}$–$\frac{3}{4}$ in., not narrowed upwards; sepals coriaceous, finally distinct. *Petals*, stamens and ovary as in the last. *Pod* $\frac{1}{2}$ ft. long, 2 in. broad, thin, firm, strongly veined.

33. **B. phœnicea,** *Heyne in Wall. Cat.* 5800; ecirrhose, leaves 9-nerved, pubescence thin dark ferruginous, pedicels short, sepals not fully distinct as long as the cylindrical tube, petals glabrous little exserted. *W. & A. Prodr.* 296. B. Benthami, *Bedd. Ic.* t. 107. B. ruficarpa, *Desv. in Ann. Sc. Nat.* ix. 430? Phanera phœnicea, *Benth. Pl. Jungh.* 262.

Ghauts of TRAVANCORE and CANARA.

An extensive climber, with slender branches, clothed at first with fine ferruginous pubescence. *Leaves* rigidly subcoriaceous, slightly cordate, thinly silky on the ribs when young, the obtuse lobes reaching $\frac{1}{6}$–$\frac{1}{4}$ down. *Racemes* few-flowered, short-peduncled, axillary and terminal. *Calyx*-tube $\frac{1}{2}$–$\frac{3}{4}$ in. Fertile *stamens* 5. *Petals* oblanceolate, with a distinct claw as long as the limb. *Ovary* densely rusty-downy, with a long style and stalk and small stigma. *Pod* flat, finely rusty-downy, $\frac{1}{2}$ ft. long, an inch broad, with a raised rib on either side of the upper suture.

34. **B. purpurea,** *Linn.*; *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 320; ecirrhose, leaves 9–11-nerved, pubescence grey, pedicels short, sepals not fully distinct exceeding the turbinate tube, petals oblanceolate glabrous exserted. *Ham. in Trans. Linn. Soc.* xiii. 497; *Wall. Cat.* 5797, *excl. A, E, I, ex parte*; *W. & A. Prodr.* 296; *Bedd. Fl. Sylv.* 92, *non DC.* B. triandra, *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 320; *Wall. Cat.* 5799. B. coromandeliana, *DC. Prodr.* ii. 515. Phanera purpurea, *Benth. Pl. Jungh.* 262.

From the foot of the WEST HIMALAYAS and KHASIA Mts. (alt. 4000 ft.), to CEYLON and PENANG.—DISTRIB. China.

A middle-sized erect tree, with moderately stout glabrescent branchlets. *Leaves* rigidly subcoriaceous, glabrous, shallowly cordate, the lobes obtuse or subacute, reaching $\frac{1}{3}$–$\frac{1}{2}$ way down. *Flowers* in terminal and axillary short-peduncled few-flowered corymbs; bracts minute, deltoid; lower pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. *Calyx*-tube $\frac{1}{4}$–$\frac{1}{2}$ in.; limb $\frac{3}{4}$–1 in., coriaceous, slit into two valves, which show a division into 5 teeth. *Petals* oblanceolate, with a long claw, reddish, twice the calyx. Fertile *stamens* 3–4. *Ovary* grey downy, with a long stalk and style and moderately large oblique stigma. *Pod* $\frac{1}{2}$–1 ft, by $\frac{3}{4}$–1 in., firm, flat, glabrous, late in dehiscing, rather decurved, 12–15-seeded.

35. **B. variegata,** *Linn.*; *DC. Prodr.* ii. 514; ecirrhose, leaves 9–11-nerved, pubescence grey, pedicels short, calyx-limb entire spathaceous equalling the cylindrical tube, petals glabrous obovate clawed much exserted. *Ham. in Trans. Linn. Soc.* xiii. 496; *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 319; *Wall. Cat.* 5795; *Bedd. Fl. Sylv.* 92. B. purpurea, *Wall. Cat.* 5797, *ex parte*. B. candida, *Roxb. Hort. Beng.* 31; *Fl. Ind.* ii. 318; *Wall. Cat.* 5796, *non Ait.* Phanera variegata, *Benth. Pl. Jungh.* 262.

From the foot of the WESTERN HIMALAYAS, and SIKKIM, alt. 4000 ft., and through India proper, to BIRMA.—DISTRIB. China.

General habit of the last, to which it is closely allied. *Leaves* rather broader than deep, middle-sized, rigidly subcoriaceous, deeply cordate, the obtuse lobes reaching $\frac{1}{4}$–$\frac{1}{3}$ down. *Corymbs* few-flowered, lateral, sessile or short-peduncled; bracts minute, deltoid; pedicels erecto-patent, $\frac{1}{4}$–$\frac{1}{2}$ in. *Calyx*-tube $\frac{3}{4}$–1 in.; limb cordate-ovate, remaining to the end spathaceous and entire. *Petals* $1\frac{1}{2}$–2 in. long, an inch or more broad, white, beautifully variegated with red and yellow, sometimes pure white (*B. candida*, Roxb.) *Stamens* 3–5. *Ovary* with a long stalk and style and a minute stigma. *Pod* $\frac{1}{2}$–1 ft. long, $\frac{3}{4}$–1 in. broad, hard, flat, glabrous, rather decurved, dehiscent, 10–15-seeded.

SECT. 5. **Lasiobema,** *Korthals*, gen. Fertile *stamens* 3. *Calyx*-tube scarcely any. *Flowers* minute, in copiously panicled racemes.

36. **B. anguina,** *Roxb. Cor. Pl.* iii. t. 285; *Fl. Ind.* ii. 328; *DC. Prodr.* ii. 516; *Wall. Cat.* 5773; *W. & A. Prodr.* 298. B. scandens, *Linn. Sp. Plant. edit.* i. 374, *ex parte* (Rheede Hort. Mal. viii. t. 30–31). Lasiobema anguina and Horsfieldii, *Miq. Fl. Ind. Bat.* i. 71.

From EASTERN BENGAL and SIKKIM to BIRMA and EASTERN and WESTERN PENINSULA.—DISTRIB. Malay isles.

A climbing glabrous shrub, with copious circinate tendrils. *Leaves* thin, deeply cordate, 5–7-nerved, the cleft very variable, sometimes scarcely perceptible, sometimes a deep deltoid sinus and the points acuminate. *Racemes* cylindrical, 2–6 in. long, arranged in ample axillary and terminal panicles; bracts minute, linear; pedicels $\frac{1}{8}$ in., erecto-patent, finely downy. *Calyx* $\frac{1}{24}$ in. long, broadly campanulate, with 5 deltoid teeth. *Petals* white, oblanceolate, twice the length of the calyx. *Pod* thin, flat, oblong, glabrous, indehiscent, stalked, $1\frac{1}{2}$–2 in. long, 1–2-seeded.

SECT. 6. **Casparea,** DC. *Calyx*-tube fusiform; limb spathaceous. Fertile *stamen* one.

37. **B. monandra,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 73.

BIRMA, *Dr. Brandis.*

Young branches puberulous. *Leaves* round-ovate, truncate at the base, palmately 11-nerved, chartaceous, 1–$1\frac{1}{2}$ in. long, glabrous above, downy on the ribs below, cut one-third down into two rounded lobes. *Racemes* short, terminal, pubescent; pedicels 1–$1\frac{1}{4}$ in., densely puberulous; bracts minute, subulate. *Calyx* downy externally. *Petals* $1\frac{1}{4}$ in., obovate-cuneate, glabrous, undulated, probably whitish. *Ovary* stalked, fulvo-villose; style slender, twice as long as the ovary. *Pod* unknown.—*Ex Kurz loc. cit.*

DOUBTFUL SPECIES.

B. LUCIDA, *Wall. Cat.* 5779 B (totally different from 5779 A), grown in the Calcutta garden from Penang, has the fully divided leaves of section *Lysiphyllum,* but the flower is unknown. The half-leaves are dimidiate cordate-ovate, twice as long as broad, narrowed gradually to a point, rigidly subcoriaceous, 3–4-nerved, with the ribs beneath clothed with adpressed ferruginous tomentum. It may be the Malayan Phanera diptera, *Miq. Flor. Ind. Bat.* i. 70.

B. PIPERIFOLIA, *Roxb. Fl. Ind.* ii. 327 (Phanera, Benth. Pl. Jungh. 262), from the mountain forests of Silhet, is said to be a climber with entire cordate 5–7-nerved smooth lucid leaves, terminal panicles and 1–2-seeded round-oval pods.

115. **NEPTUNIA,** Lour.

Herbs without prickles. *Leaves* bipinnate, with persistent stipules and numerous small strap-shaped sensitive membranous leaflets. *Flowers* minute, dimorphous, in dense heads on axillary peduncles, polygamous, those of the lower part of the head bearing only protruded flattened staminodia. *Calyx* minute, campanulate, 5-toothed. *Petals* 5, strap-shaped, connate near the base. *Stamens* of the perfect flowers exserted; anthers gland-crested. *Ovary* stalked, many-ovuled; style filiform, stigma club-shaped. *Pod* coriaceous, flattened, ligulate or oblong, 2-valved.—DISTRIB. Species 8; cosmopolitan in the tropics.

1. **N. oleracea,** *Lour.*; *Benth. in Hook. Journ.* iv. 354; stems almost entirely prostrate, leaflets 16–30, sterile flowers numerous, pod oblique oblong 6–10-seeded. *Dalz. & Gibs. Bomb. Fl.* 84. Mimosa natans, *Roxb. Cor. Pl.* t. 119; *Hort. Beng.* 40; *Fl. Ind.* ii. 553. Desmanthus natans, *Willd.*; *DC. Prodr.* ii. 444; *Wall. Cat.* 5295; *W. & A. Prodr.* 270. D. lacustris and stolonifer, *DC. Prodr. loc. cit.*

NORTH WEST provinces, to CEYLON and MALACCA.—DISTRIB. Cosmopolitan in tropics.

Stems stout, annual, wide-creeping, rarely throwing out suberect branches, producing copious fibrous rootlets from the same nodes that bear the leaves and peduncles. *Pinnæ* 4–6, 2–3 in. long; rachis glandless; leaflets glabrous, obtuse, $\frac{1}{3}$–$\frac{1}{2}$ in. long. *Peduncles* ascending, $\frac{1}{4}$–1 ft.; bracts small, ovate, subobtuse. *Staminodes* $\frac{1}{4}$–$\frac{1}{3}$ in., strap-shaped, yellow. *Corolla* $\frac{1}{24}$ in. *Pod* $\frac{1}{2}$–1 in. long, rostrate, dry, soon dehiscing by the upper suture.

2. **N. triquetra,** *Benth. in Hook. Journ. Bot.* iv. 355; stems slender ascending, leaflets 28–30 small, sterile flowers few, pod oblong not oblique 4–8-seeded. *Dalz. & Gibs. Bomb. Fl.* 84. Mimosa triquetra, *Vahl*; *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 552. Desmanthus triquetrus, *Willd.*; *DC. Prodr.* ii. 444; *Wall. Cat.* 5296; *W. & A. Prodr.* 270; *Wight Ic.* t. 756.

WESTERN PENINSULA and BUNDELKUND.—DISTRIB. Brazil?

A low diffuse perennial, with slender stems, angular upwards. *Stipules* small, acute; pinnæ 2–6, an inch or less long, with a gland on the rachis between the lowest pair; leaflets $\frac{1}{8}$–$\frac{1}{4}$ in. *Heads* small, globose, long or short-peduncled. *Corolla* yellow, $\frac{1}{12}$ in. long. Sterile *flowers* sometimes quite absent from the heads. *Pod* $\frac{1}{2}$–1 in. long, with more membranous valves than in the two others, and a very minute beak.

N. PLENA, *Benth. in Hook. Journ. Bot.* iv. 355; stems stout ascending, leaflets 40–60, sterile flowers numerous, pod oblong-ligulate 15–20-seeded. Mimosa Adenanthera, *Roxb. Fl. Ind.* ii. 554. Desmanthus Adenanthera, *Wall. Cat.* 5298. D. plenus, punctatus and polyphyllus, *DC. Prodr.* ii. 444–5.

NORTH WEST provinces and CEYLON, introduced. A native of Tropical America.

Glabrous throughout. *Stems* comparatively stout, suffruticose, several feet high. *Pinnæ* 6–10, with a gland between the lowest pair; leaflets like those of the last. *Stipules* and bracts copious, cordate-ovate, acuminate. *Heads* copious, oblong. *Flowers* and heads just like those of *N. oleracea,* but the pod twice as long.

116. XYLIA, Benth.

Tall unarmed tree. *Leaves* bipinnate. *Flowers* in round heads, mostly perfect. *Calyx* tubular, 5-toothed at the tip. *Petals* 5, valvate, slightly united at the base, little longer than the calyx. *Stamens* 10, free, exserted; anthers gland-crested in an early stage. *Ovary* sessile, many-ovuled; style filiform, stigma minute terminal. *Pod* large, woody, oblong-falcate, finally dehiscing, flat, septate between the oblong compressed seeds.—A single species.

1. **X. dolabriformis,** *Benth. in Hook. Journ. Bot.* iv. 417. *Dalz. & Gibs. Bomb. Fl.* 85; *Bedd. Fl. Sylv.* t. 186; *Brand. For. Fl.* 171. Mimosa xylocarpa, *Roxb. Cor. Pl.* t. 100; *Hort. Beng.* 40; *Fl. Ind.* ii. 543. Inga xylocarpa, *DC. Prodr.* ii. 439; *Wall. Cat.* 5277; *W. & A. Prodr.* 269. I. lignosa, *Grah. in Wall. Cat.* 5278. I. dolabriformis, *Grah. in Wall. Cat.* 5279.

WESTERN PENINSULA, BIRMA, SINGAPORE.—DISTRIB. Philippines.

A tall tree, without prickles. *Pinnæ* 2; leaflets 4–10, opposite, with an odd one on the outside and with a gland on the rachis between each, oblong, acute, subcoriaceous, glabrous, 3–6 in. long, the lowest much shorter. *Flowers* sessile, in dense globose peduncled heads, crowded on short branchlets developed with the young leaves. *Corolla* $\frac{1}{4}$ in. *Pod* 4–6 in. by 1–2$\frac{1}{2}$ in., 6–10-seeded.

117. ENTADA, Adans.

Woody unarmed climbers with tendrils. *Leaves* bipinnate. *Flowers* in long narrow spikes, minute, yellowish, polygamous. *Calyx* minute, campanulate, equally 5-toothed. *Corolla* oblong in bud, the 5 long equal narrow lobes falcate in expansion. *Stamens* 10, free, shortly exserted, filaments filiform; anthers crowned with a gland. *Ovary* subsessile, many-ovuled; style filiform, stigma concave terminal. *Pod* flat, woody, very large, composed of many discoid one-seeded joints, the endocarp persisting round the large compressed orbicular seeds.—DISTRIB. Species 10, the others Trop. African and American.

1. **E. scandens,** *Benth. in Hook. Journ. Bot.* iv. 332. *Brand. For. Fl.* 167. E. Pursætha, *DC. Prodr.* ii. 425; *Wall. Cat.* 5293; *W. & A. Prodr.* 267; *Dalz. & Gibs. Bomb. Fl.* 83. E. monostachya, *DC. Prodr. loc. cit.*; *Wall. Cat.* 5293. E. Rheedei and Parrana, *Spreng. Syst.* ii. 325. E. Pursætha and E. Rumphii, *Scheff. in Natuur. Tijdschr. Ned. Ind.* xxxii. 99, t. 16–18. Mimosa scandens, *Linn.*; *Roxb. Fl. Ind.* ii. 554.—*Rheede Hort. Mal.* viii. t. 32–34; ix. t. 77.

Central and Eastern Himalayas, NIPAL, ascending to 4000 ft. in SIKKIM, WESTERN PENINSULA, CEYLON, MALACCA.—DISTRIB. Cosmopolitan in the tropics.

An immense climber, with slender terete woody branches. *Leaves* long-petioled, the rachis usually ending in a tendril; pinnæ stalked, mostly 4; leaflets oblong or obovate, obtuse or acute, 1–2 in. long, rigidly coriaceous. *Spikes* peduncled, $\frac{1}{2}$ ft. long or more, usually panicled from the nodes of old leafless branches, sometimes simple from the axils of the leaves (E. monostachya, DC.). *Flowers* $\frac{1}{12}$–$\frac{1}{8}$ in. long, sessile or on short pedicels. *Pod* 1–2 ft. or more by 3–4 in., curved, constricted between the seeds. *Seeds* 2 in. broad.

118. ADENANTHERA, Linn.

Erect trees without spines or tendrils. *Leaves* ample, bipinnate. *Flowers* minute, in narrow spike-like racemes, hermaphrodite, usually pentamerous. *Calyx* campanulate, equally toothed. *Petals* valvate, equal, lanceolate, cohering only at the very base. *Stamens* 10, free, equalling the corolla; anthers tipped with a gland. *Ovary* sessile, many-ovuled; style filiform, stigma minute capitate. *Pod* strap-shaped, torulose, falcate, the coriaceous valves much twisted after they separate. *Seeds* small, bright-coloured.—DISTRIB. Species 4, spread through tropics of Old World.

1. **A. pavonina,** *Linn.*; *DC. Prodr.* ii. 446; pinnæ 8–12, leaflets 12–18 obtuse, seeds concolorous usually bright scarlet. *Roxb. Fl. Ind.* ii. 370; *Wall. Cat.* 5300; *W. & A. Prodr.* 271; *Wight Ill.* t. 84 (80); *Bedd. Fl. Sylv.* t. 46; *Brand. For. Fl.* 168.

EAST HIMALAYAS (ascending to 4000 ft. in Sikkim), WESTERN PENINSULA and CEYLON, shore of MALAY gulf.—DISTRIB. Malay isles, Timor, China, Philippines.

Pinnæ short-stalked, 4–8 in. long; leaflets oblong, alternate, short-stalked, not coriaceous, $\frac{3}{4}$–$1\frac{1}{2}$ in. long. *Racemes* short-peduncled, 2–6 in. long, $\frac{1}{2}$ in. broad, simple from the axils of the leaves and panicled at the end of the branches; pedicels as long as the flower, $\frac{1}{8}$–$\frac{1}{6}$ in. *Pod* 6–9 in. by $\frac{1}{2}$ in., falcate, 10–12-seeded. *Seeds* rarely yellow-brown.

2. **A. bicolor,** *Moon*; *Thwaites Enum.* 98; pinnæ and leaflets 6–8, the latter acute, seeds half black half bright red. *Bedd. Fl. Sylv.* 94.

CEYLON, *Walker*, &c. MALACCA, *Griffith, Maingay*.

Pinnæ short-stalked, 2–3 in. long. *Leaflets* ovate, rigidly subcoriaceous, $\frac{3}{4}$–$1\frac{1}{2}$ in. long. *Raceme* and pod just like those of *A. pavonina*, the flower perhaps rather smaller.

119. PROSOPIS, Linn.

Erect trees or shrubs with scattered prickles. *Leaves* bipinnate, with small narrow leaflets. *Flowers* minute, in narrow spikes or subspicate racemes, polygamous. *Calyx* minute, campanulate, subentire or faintly 5-toothed. *Petals* 5, ligulate, subcoherent at the base. *Stamens* 10, free, slightly exserted, filaments filiform; anthers crowned with a gland. *Ovary* stalked, many-ovuled; style

filiform, stigma minute terminal. *Pod* turgid, cylindrical or oblong, with a thick spongy mesocarp, septate between the seeds.—DISTRIB. Species 18, cosmopolitan in the tropics.

1. **P. spicigera,** *Linn.*; *DC. Prodr.* ii. 446; pinnæ mostly 4, rachis glabrous, flowers sessile, calyx truncate not ciliated, pod slender cylindrical torulose. *Roxb. Cor. Pl.* i. t. 63; *Wall. Cat.* 5299; *W. & A. Prodr.* 271; *Dalz. & Gibs. Bomb. Fl.* 84; *Bedd. Fl. Sylv.* t. 56; *Brand. For. Flor.* 169, t. 25; *Boiss. Fl. Orient.* ii. 634. P. spicata, *Burm. Ind.* 102, t. 25, fig. 3. Adenanthera aculeata, *Roxb. Fl. Ind.* iii. 371.

PUNJAB, SCINDE, WESTERN PENINSULA.—DISTRIB. Affghanistan, Persia.

A low tree, with slender grey branches. *Prickles* copious few or none, $\frac{1}{8}$–$\frac{1}{4}$ in., nearly straight, at first straw-coloured. *Pinnæ* 1–2 in. long; leaflets 16–24, sessile, $\frac{1}{4}$–$\frac{1}{2}$ in., ligulate, with an ascending cusp, grey, glabrous, rigidly coriaceous, caducous. *Flowers* in short-peduncled axillary spikes, 2–3 in. long, and terminal panicles. *Corolla* $\frac{1}{12}$ in. long. *Pod* straight, edible, glabrous, 4–6 in. long, $\frac{1}{4}$ in. thick, narrowed gradually into a short stalk, the mesocarp farinaceous. *Seeds* 10–15, dull brown, oblong.

2. **P. Stephaniana,** *Kunth*; *Benth. in Hook. Journ.* iv. 347; pinnæ 6–10, rachis downy, flowers short-pedicelled, pod thick oblong. *Boiss. Fl. Orient.* ii. 633; *Brand. For. Fl.* 170. Lagonychium Stephanianum, *M. Bieb.*; *DC. Prodr.* ii. 448. Mimosa agrestis, *Sieb.*; *Spr. Syst.* ii. 206.

PUNJAB, near Peshawur, &c., *Falconer, Stewart.*—DISTRIB. Caucasus, Orient, Afghanistan.

A low bushy tree, with downy slender whitish branchlets, armed with copious slender stramineous prickles. *Leaflets* like those of *P. spicigera*, but smaller and downy. *Flowers* rather larger. *Pod* oblique oblong, $\frac{1}{2}$–1 in. long, $\frac{1}{2}$ in. thick, black, rugose, obtuse, contracted abruptly into the stalk; mesocarp pulpy. *Seeds* subbiseriate.

120. DICHROSTACHYS, DC.

Shrubs. *Leaves* bipinnate, with minute coriaceous leaflets. *Flowers* minute, spicate, dimorphous, polygamous, only perfect in the upper half of the spike, those of the lower half bearing long filiform staminodia. *Calyx* minute, campanulate, 5-toothed. *Corolla* oblong, the 5 strap-shaped petals subconnate towards the base. *Stamens* of the perfect flowers slightly exserted, filaments filiform free; anthers gland-crested. *Ovary* sessile, many-ovuled; style filiform, stigma capitate. *Pod* small, strap-shaped, coriaceous, indehiscent, subarticulated, continuous within, twisted up when mature.—DISTRIB. Species 4–5, confined to the tropics of the Old World.

1. **D. cinerea,** *W. & A. Prodr.* 271; *Wight Ic.* t. 357; *Dalz. & Gibs. Bomb. Fl.* 84; *Bedd. Fl. Sylv.* t. 185; *Brand. For. Fl.* 171. Mimosa cinerea, *Linn.*; *Roxb. Cor. Pl.* t. 174; *Fl. Ind.* ii. 561. Desmanthus cinereus, *Willd.*; *DC. Prodr.* ii. 445. Acacia cinerea, *Spreng.*; *Wall. Cat.* 5231. A. Dalea, *Desv.*; *DC. Prodr.* ii. 459.

NORTH WEST PROVINCES, WESTERN PENINSULA, CEYLON.—DISTRIB. Malay isles, N. Australia, and doubtfully distinct from *D. nutans*, of Tropical Africa.

A much-branched shrub, with copious spreading branchlets, ending in spines. *Leaves* 1–1$\frac{1}{2}$ in. long and broad; rachises often downy; pinnæ 16–20; leaflets 24–40, strap-shaped, sessile, rigidly coriaceous, $\frac{1}{12}$–$\frac{1}{8}$ in. long. *Spikes* axillary, short-peduncled, 1–2 in. long. *Corolla* $\frac{1}{24}$ in. *Staminodes* red-purple, $\frac{1}{2}$ in. long. *Pod* 2–3 in. by $\frac{1}{4}$–$\frac{3}{8}$ in., 6–10-seeded, dry, glabrous.

121. **PIPTADENIA,** Benth.

Erect trees, unarmed or prickly. *Leaves* bipinnate. *Flowers* small, in dense spikes, hermaphrodite, pentamerous. *Calyx* campanulate, shortly 5-toothed. *Petals* 5, valvate, equal, lanceolate, cohering at the base. *Stamens* 10, free, as long as the corolla; anthers tipped with a deciduous gland. *Ovary* stalked, many-ovuled; style filiform, stigma terminal. *Pod* long, thin, strap-shaped, flat. *Seeds* brown, compressed.—DISTRIB. Species 30, all the rest but two from Africa Tropical American.

1. **P. oudhensis,** *Brand. For. Flor.* 168; *Benth. in Trans. Linn. Soc.* xxx. 366.

OUDH, in forests under the base of the hills in Gonda, *Richd. Thompson.*

A middle-sized tree, armed with large conical prickles, glabrous except the inflorescence. *Pinnæ* 4, long-stalked, each of a single pair of nearly sessile obtuse obovate coriaceous leaflets 2 in. long. *Panicles* axillary, much shorter than the leaves; spikes dense, 1–1½ in. by ⅜ in. *Calyx* minute; teeth obscure. *Petals* ⅛ in., lanceolate, greenish-yellow. *Stamens* just exserted. *Pod* 9–12 in. by ⅜ in., with a long stalk, nearly straight. *Seeds* 15–20.

122. **PARKIA,** R. Br.

Tall, unarmed trees. *Leaves* bipinnate with very numerous leaflets. *Flowers* in dense long-peduncled heads, each subtended by a coriaceous persistent ligulate bract with a spoon-shaped tip. *Calyx* tubular, shortly 5-cleft. *Corolla* tubular, cleft half-way down, the segments subvalvate. *Stamens* 10, exserted, the filiform filaments united in the lower part with each other and the corolla-tube; anthers narrow, glandless, the pollen cohering in irregular masses. *Ovary* stalked, many-ovuled; style filiform, stigma minute capitate. *Pod* large, flat, strap-shaped, coriaceous, finally dehiscing.—DISTRIB. Species 8, cosmopolitan in the tropics, mostly American.

1. **P. biglandulosa,** *W. & A. Prodr.* 279; glands of petiole 2, leaflets linear-ligulate 150–200 to a pinna. Mimosa pedunculata, *Roxb. Fl. Ind.* ii. 551.

MALAY peninsula, *Roxburgh.* Elsewhere cultivated.

Rachis of *leaf* downy, 1 ft. or more long; pinnæ 40–60, 3–4 in. long; leaflets 1-nerved, rigid, ¼ in. by $\frac{1}{24}$ in. *Peduncle* under a foot long in the specimens seen. *Calyx* ⅓ in.; tube glabrous; teeth pilose. Immature *pod* downy, narrowed gradually into a long stalk.

2. **P. Roxburghii,** *G. Don Gen. Syst.* ii. 397; gland of petiole solitary, leaflets linear-ligulate 100 or more to a pinna. P. Brunonis, *Grah. in Wall. Cat.* 5288. P. biglobosa, *Benth. in Hook. Journ.* iv. 328. Mimosa biglobosa, *Roxb. Fl. Ind.* ii. 551, *non Jacq.*

ASSAM, SILHET, BIRMA, MALAY PENINSULA.—DISTRIB. Malay isles.

An erect tree, 40–60 feet high. *Leaf*-rachis a foot or more long, glabrous or pubescent; pinnæ 20 or more, 3–4 in. long; leaflets 100–120, ¼–⅓ in. by $\frac{1}{12}$ in., with rarely any other veins than the costa perceptible. *Peduncle* 1–1½ ft.; flowers in turbinate heads 2–3 in. long. *Calyx* ¼ in.; tube cylindrical, glabrous; lobes pilose. *Pod* 1 ft. by 1–1½ in., narrowed into a 3–4 in. stalk.

3. **P. leiophylla,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 73; leaflets broad-ligulate 50–60 to a pinna, pinnæ 20 or more.

PEGU, *Kurz*.

An erect tree 80–120 feet high. *Leaf* 1–2 feet long; rachis fulvo-pubescent, pinnæ 4 in. long; leaflets rigidly coriaceous, shining, glabrous, ½ in. by ⅛ in., with a distinct fork from the base of the costa and penninerved veinlets. *Peduncle* 1–1½ ft. *Calyx* ⅓ in.; tube glabrous; lobes round, densely fulvo-tomentose. *Pod* 1–1½ ft. by 1½ in., glabrous, slightly torulose, narrowed into a 6–9 in. stalk.

4. **P. insignis,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 74; leaflets oblong 40–50 to a pinna, pinnæ about 8.

MARTABAN, *Kurz*.

An erect tree, 80–100 ft. high. *Leaf* 1–2 ft. long; rachis fulvo- or ferrugineo-tomentose; leaflets 1 in. by ⅓ in., coriaceous, penninerved, glabrous above except on the ribs, pubescent beneath. *Peduncles* a foot long, many arising from the apex of the branches. *Calyx* ⅓ in.; tube glabrous; lobes obovate-cuneate, with adpressed fulvous pubescence. *Pod* unknown.—Ex Kurz loc. cit.

123. DESMANTHUS, Willd.

Suffruticose perennials with the habit and leaves of *Neptunia*. *Flowers* polygamous. *Calyx* minute, campanulate, 5-toothed. *Petals* 5, valvate, finally nearly free. *Stamens* 10; filaments free, filiform; anthers not gland-crested. *Ovary* sessile, linear, many-ovuled; style filiform, stigma clavate. *Pod* linear, straight, coriaceous, dehiscent.—DISTRIB. Species 8, indigenous in America only.

D. VIRGATUS, *Willd.*; *DC. Prodr.* ii. 445; *Wall. Cat.* 5297; *W. & A. Prodr.* 270. D. strictus and leptophyllus, *DC. loc. cit.* Mimosa virgata, *Linn. Sp.* 1502.

Scattered through India proper and Ceylon, but only introduced.—DISTRIB. Wild through Trop. America and introduced in Africa.

A glabrous shrubby perennial, 3–4 ft. high, with virgate branches; stipules subulate. *Flowers* in solitary globose peduncled axillary heads. *Leaves* with 6–8 pinnæ, with a gland on the rachis between the lowest; leaflets 30–40. *Pod* 2–3 in. long, 20–30-seeded.

124. **LEUCÆNA,** Benth.

Unarmed erect trees. *Leaves* bipinnate. *Flowers* sessile, in dense globose heads, 5-merous, usually perfect. *Calyx* cylindrical-campanulate, shortly-toothed. *Petals* valvate, free. *Stamens* 10, free, much exserted; anthers not gland-crested. *Ovary* stalked, many-ovuled; style filiform, stigma minute terminal. *Pod* flat, coriaceous, strap-shaped, dehiscent.—DISTRIB. Species 8, mostly American.

1. **L. glauca,** *Benth. in Hook. Journ. Bot.* iv. 416. Acacia frondosa, *Willd.*; *DC. Prodr.* ii. 468; *W. & A. Prodr.* 276. A. Caringa, *Ham. in Wall. Cat.* 5239. A. glauca, biceps and leucocephala, *DC. Prodr.* ii. 467–8.

Spread throughout India, as it is through Trop. Asia and Africa, but probably indigenous only in Tropical America.

A low erect tree, without spines. *Pinnæ* 8–16; leaflets 20–30, linear, acute, glaucous, membranous, caducous, ⅜–½ in., finely downy. *Heads* short-peduncled, very dense, often in pairs, ½–¾ in. broad. *Corolla* whitish, ⅛ in. *Stamens* twice the length of the corolla. *Pod* straight, 5–6 in. by ⅜–½ in., 15–20-seeded, soon dehiscing.

125. **MIMOSA,** Linn.

Shrubs or herbs, with or without prickles. *Leaves* in the indigenous species bipinnate; leaflets small, sensitive, ligulate, caducous. *Flowers* minute, in dense globose heads, polygamous, in the Indian species mostly tetramerous. *Calyx* campanulate, shortly toothed. *Petals* connate towards the base. *Stamens* twice the number of the petals, much exserted, filaments filiform, free; anthers not gland-crested. *Ovary* stalked, many-ovuled; style filiform, stigma minute terminal. *Pod* flat, membranous, made up of 1-seeded joints that separate when mature from the sutures.—DISTRIB. Species 230, mostly confined to Trop. America.

1. **M. pudica,** *Linn.*; *DC. Prodr.* ii. 426; stem and rachises copiously bristly and prickly, leaves digitate, pod small with densely prickly sutures. *Roxb. Hort. Beng.* 41; *Fl. Ind.* ii. 564; *Wall. Cat.* 5292.

Spread through the hotter parts of India, possibly introduced from Trop. America.

Shrubby, the copious bristly hairs of the branchlets and petioles deflexed, those of the leaf-rachis ascending. *Pinnæ* of the leaves 3–4, nearly sessile, 2–3 in. long; leaflets 24–40, glabrous, subcoriaceous. *Flowers* in small peduncled heads, all down the branches, 1–2 from each axil. *Pod* $\frac{1}{2}$ in. long, 3–4-seeded, with very abundant straw-coloured weak prickles from both sutures, as long as the breadth of the pod.

2. **M. rubicaulis,** *Lam.*; *DC. Prodr.* ii. 429; rachises copiously prickly not bristly, leaves bipinnate, pinnæ 8–20, pod strap-shaped, the sutures mostly without prickles. *Wall. Cat.* 5289; *W. & A. Prodr.* 268; *Dalz. & Gibs. Bomb. Fl.* 85. M. octandra, *Roxb. Cor. Pl.* t. 200; *Hort. Beng.* 41; *Fl. Ind.* ii. 564. M. mutabilis, *Roxb. Hort. Beng.* 41; *Fl. Ind. loc. cit.* M. Rottleri, *Spreng. Syst.* ii. 206.

WESTERN HIMALAYAS, ascending to 5000 ft. in KUMAON, westward to MISHMI and BHOTAN, and through India proper.—DISTRIB. Afghanistan.

A low tree, with slender grooved finely grey-downy branches, armed with copious small scattered hooked spines. *Leaflets* 12–24, membranous, $\frac{1}{4}$–$\frac{1}{2}$ in. long, rather downy below, not venulose, with an obscure recurved cusp. *Heads* $\frac{3}{8}$–$\frac{1}{2}$ in. broad, on short simple erecto-patent peduncles, from the leaf axils and crowded at the top of the branchlets, at first reddish, afterwards bleached. *Corolla* $\frac{1}{24}$ in. *Pod* rather falcate, 3–4 in. by $\frac{3}{8}$–$\frac{5}{8}$ in., 6–10-seeded, the sutures rarely furnished (*M. spinosisiliqua*, Rottler) with a few distant prickles.

3. **M. hamata,** *Willd.*; *DC. Prodr.* ii. 427; rachises copiously prickly not bristly, leaves bipinnate, pinnæ 6–8, pod ligulate-oblong with the sutures armed with large hooked prickles. *W. & A. Prodr.* 268; *Dalz. & Gibs. Bomb. Fl.* 85. M. armata, *Rottl.*; *Spreng. Syst.* ii. 206; *Wall. Cat.* 5290.

WESTERN PENINSULA.

Closely allied to *M. rubicaulis*, with which it agrees in prickles, general habit and inflorescence. *Leaflets* 12–20, oblique, ligulate-oblong, $\frac{1}{24}$–$\frac{1}{4}$ in. long, downy or glabrous. *Pod* rather shorter and broader, downy or glabrous, 4–6-seeded.

4. **M. sepiaria,** *Benth. in Hook. Journ. Bot.* iv. 395; rachises without either prickles or bristles, leaves bipinnate, pinnæ 12–14, pod ligulate with unarmed sutures.

SINGAPORE, *Schomburgk*, *Maingay*.—DISTRIB. China. Doubtless introduced into Asia from Trop. America, where it is common.

A woody shrub, glabrous except the leaf-rachises, which are slightly downy. *Leaflets* 12–20, rigidly coriaceous, narrow ligulate, caducous, $\frac{1}{4}$–$\frac{1}{3}$ in. long, with a

distinct midrib nearer the upper side and conspicuous veinlets. *Heads* globose, forming an ample patent panicle with compound spreading lower branches. *Flowers* sometimes pentamerous. *Corolla* $\frac{1}{24}$ in. *Pod* distinctly stalked, nearly straight, $1\frac{1}{2}$–2 in. by $\frac{1}{4}$–$\frac{1}{3}$ in., glossy, finely reticulato-venulose, 6–8-seeded.

126. ACROCARPUS, W. & A.

An erect unarmed tree. *Leaves* bipinnate. *Flowers* racemed. *Calyx* campanulate, cleft about half-way down into 5 equal lanceolate teeth, the disk completely investing the tube. *Petals* oblanceolate, equal, half as long again as the calyx. *Stamens* 5, exserted, straight, equal; anthers uniform. *Ovary* stalked, linear, many-ovuled; style incurved, very short, stigma small terminal. *Pod* long-stalked, flat, ligulate, many-seeded, with a wing down the upper suture.—DISTRIB. A single species.

1. **A. fraxinifolius,** *Wight Ic.* t. 254 (*excluding the leaf*); *Arnott in Jardine Mag.* ii. 547; *Wight Ill.* p. 198; *Bedd. Fl. Sylv.* t. 44. A. combretiflorus, *Teysm. & Binnen.*; *Walp. Ann.* vii. 811.

NILGHIRIS, *Wight, Beddome, Brandis.* SIKKIM, *Hook. fil.*—DISTRIB. Sumatra.

A large unarmed erect tree, 50 feet high before it forks. *Pinnæ* 8, a foot or more long; leaflets 10–12, nearly sessile, oblong, rather oblique, glabrous, subcoriaceous, 3–4 in. long. *Flowers* in dense simple racemes produced in February, when the leaves are fallen; pedicels short, drooping. *Calyx* $\frac{1}{4}$ in. *Petals* scarlet, slightly imbricated in bud. *Filaments* twice the length of the corolla. *Ovules* about 15. *Pod* long-stalked, thin, flat, with a wing down the upper suture.

127. ACACIA, Willd.

Spinose or prickly shrubs or trees, erect or climbing. *Leaves* bipinnate, with minute leaflets. *Flowers* in globoseheads or cylindrical spikes, hermaphrodite or polygamous, usually pentamerous. *Calyx* campanulate or funnel-shaped, shortly toothed. *Petals* exserted, united in the lower half. *Stamens* free, indefinite, much exserted; anthers minute, not gland-crested. *Ovary* stalked or sessile, many-ovuled; style filiform, stigma minute capitate. *Pod* ligulate or oblong, not jointed, usually compressed and dry, dehiscent or indehiscent, rarely turgid or subcylindrical, sutures straight or wavy, not thickened.—DISTRIB. Species 430, the foliiferous groups cosmopolitan in the tropics, the great phyllodineous series, which comprises two-thirds of the genus, almost restricted to Australia.

A. melanoxylon, R. Br., and *A. dealbata*, Link, both Australian species, have been extensively planted in the Nilghiris.

SERIES I. **Gummiferæ globiferæ.** Erect shrubs or trees. *Spines* long and straight. *Stipules* spinescent. *Flowers* in rounded heads.

1. **A. Farnesiana,** *Willd.*; *DC. Prodr.* ii. 461; pinnæ 8–16, leaflets 20–40, heads axillary, pod thick short cylindrical glabrous with straight sutures biserial seeds and pulpy mesocarp. *Wall. Cat.* 5264, *excl.* 1.; *Bedd. Fl. Sylv.* t. 52. Mimosa Farnesiana, *Linn.*; *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 557. Vachellia Farnesiana, *W. & A. Prodr.* 272; *Wt. Ic.* t. 300. Acacia indica, *Desv.*; *DC. Prodr.* ii. 462. Farnesia odora, *Gaspar in Linnæa*, 1839, *Litter.* 134.

HIMALAYAS to CEYLON and PENANG,—DISTRIB. Cosmopolitan in the Tropics, but often planted.

A shrub or low tree, with slender zigzag branches, marked with grey dots. *Spines* stipular only, seldom over $\frac{1}{4}$–$\frac{1}{2}$ in. long on the branchlets. *Leaf*-rachises downy, with a minute petiolar gland; pinnæ 1–$1\frac{1}{2}$ in. long; leaflets green, subglabrous, rigidly

coriaceous. *Peduncles* crowded in the nodes of full-grown leaves, shorter than the leaves, with the ring of bracts at or near the apex. *Heads* fragrant, bright yellow, under $\frac{1}{2}$ in. diam. *Calyx* campanulate, very minute. *Corolla* $\frac{1}{24}$ in.; teeth short, obtuse. *Pod* 2–3 in. long, $\frac{1}{2}$ in. thick, dull brown, marked with fine close horizontal striæ.

2. **A. planifrons,** *W. & A. Prodr.* 276; pinnæ 10–16, leaflets 16–24, heads axillary, pod narrow ligulate turgid with straight sutures. *Bedd. Fl. Sylv.* 95. A. Farnesiana, *Wall. Cat.* 5264 I. A. Roxburghii, *W. & A. Prodr.* 276. A. Campbellii, *Arn. Pug.* 15. Mimosa eburnea, *Roxb. Cor. Pl.* t. 199; *Fl. Ind.* ii. 558, *non Linn.* M. horrida, *Sm. in Rees Cyclop.*

WESTERN PENINSULA.

A tree, with a flat umbrella-like top, and glabrous branches with grey lenticular dots. *Spines* $\frac{1}{4}$–$\frac{1}{2}$ in. long, the old ones spreading, $\frac{1}{4}$ in. thick, very pungent. *Leaves* glabrous, very small; glands of the rachis 0 or minute; pinnæ $\frac{1}{4}$–$\frac{1}{3}$ in. long; leaflets $\frac{1}{12}$–$\frac{1}{8}$ in., rigidly coriaceous, glaucous-green, glabrous. *Heads* in clusters from the axils of mature branchlets, $\frac{1}{4}$–$\frac{1}{3}$ in. diam.; peduncles very slender, with the involucre below the middle. *Corolla* $\frac{1}{24}$ in., yellow, twice the calyx. *Pod* subcylindrical, glabrous, 2–3 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. thick, circinate, rigidly subcoriaceous, indehiscent.

3. **A. arabica,** *Willd.*; *DC. Prodr.* ii. 461; pinnæ 6–12, leaflets 20–40, heads axillary, pod straight strap-shaped firm grey-downy with sutures deeply indented between each seed. *Wall. Cat.* 5246; *W. & A. Prodr.* 277; *Bedd. Fl. Sylv.* t. 47; *Dalz. & Gibs. Bomb. Fl.* 86. A. vera, *Willd. loc. cit.* Mimosa arabica, *Lam.*; *Roxb. Cor. Pl.* t. 149; *Hort. Beng.* 40; *Fl. Ind.* ii. 557.

PUNJAB to BEHAR, WESTERN PENINSULA and CEYLON.—DISTRIB. Arabia, Egypt, Trop. Africa, Natal.

A shrub or tree, with straight finely grey-downy branchlets. *Spines* $\frac{1}{4}$–2 in. long, large, white, ascending and pungent on the older branchlets. *Leaf*-rachises downy, with several glands; pinnæ $\frac{1}{2}$–$1\frac{1}{2}$ in. long; leaflets membranous, green, $\frac{1}{8}$–$\frac{1}{4}$ in., glabrous or rather downy. *Peduncles* short, densely grey-downy, with the bracts above the middle, 4–6-nate, the subtending leaves of the upper nodes reduced or suppressed; heads yellow, $\frac{1}{2}$ in. diam. *Calyx* $\frac{1}{24}$ in., campanulate. *Corolla* twice the length of the calyx. *Pod* rigidly coriaceous, subindehiscent, densely persistently grey-downy, 8–12-seeded, $\frac{1}{4}$–$\frac{1}{2}$ ft. by $\frac{1}{2}$–$\frac{5}{8}$ in., distinctly stalked.

4. **A. eburnea,** *Willd.*; *DC. Prodr.* ii. 461; pinnæ 4–10, leaflets 12–16, heads axillary, pod straight narrow-ligulate rigidly coriaceous dehiscent glabrous with slightly repand sutures. *W. & A. Prodr.* 276; *Dalz. & Gibs. Bomb. Fl.* 85; *Bedd. Fl. Sylv.* 95; *Boiss. Fl. Orient.* ii. 637. Mimosa eburnea, *Linn. fil. Suppl.* 437, *non Roxb.*

EAST HIMALAYAS and PUNJAB to the WESTERN PENINSULA and CEYLON.—DISTRIB. Afghanistan, Arabia.

General habit of *A. arabica*, with fewer leaflets and a different pod. *Branchlets* slender, downy or glabrous. *Spines* $\frac{1}{4}$–2 in., the large ones white, $\frac{1}{8}$–$\frac{1}{6}$ in. *Pinnæ* $\frac{1}{4}$–$\frac{1}{2}$ in. long, with a gland between the lowest pair; leaflets $\frac{1}{12}$–$\frac{1}{8}$ in., rigidly coriaceous, grey-green. *Heads* yellow, under $\frac{1}{2}$ in. diam. from the axils of developed leaves; peduncles densely grey-downy, with the involucre about the middle. *Calyx* $\frac{1}{24}$ in., funnel-shaped, shortly toothed. *Corolla* scarcely twice the length of the calyx. *Pod* distinctly stalked, 3–6 in. by $\frac{1}{4}$ in., thin, flat, straight, drab, glossy, rather venulose, 6–10-seeded.

5. **A. Jacquemontii,** *Benth. in Hook. Journ. Bot.* i. 499; pinnæ 6–8, leaflets 12–16, heads axillary, pod thin flat broad-ligulate dehiscent glabrous with straight sutures.

Plains of the NORTH WEST provinces.

General habit of *A. eburnea*, from which it mainly differs in the pod. *Spines* slender, reaching 1½–2 in. long. *Pinnæ* ¼–½ in. long; leaflets grey-green, subglabrous, rigidly coriaceous. *Heads* yellow, ½ in. diam. *Corolla* $\frac{1}{24}$ in., twice the length of the calyx. *Pod* straight, flexible, grey, 2–3 in. by ½–⅝ in., 5–6-seeded, with a stalk ¼–½ in. long.

6. **A. tomentosa,** *Willd.*; *DC. Prodr.* ii. 462; pinnæ 12–24, leaflets 40–60, heads axillary, pod thin flat ligulate-falcate dry dehiscent with straight sutures thinly grey-downy. *Wall. Cat.* 5247; *W. & A. Prodr.* 276. *Bedd. Fl. Sylv.* 95; *Dalz. & Gibs. Bomb. Fl.* 86. A. chrysocoma, *Miq. Flor. Ind. Bat.* i. 6. Mimosa tomentosa, *Roxb. Hort. Beng.* 41; *Fl. Ind.* ii. 558. M. Kleinii, *Poir. Dict. Suppl.* i. 82.

WESTERN PENINSULA and CEYLON.

A small tree, with the branchlets and leaf-rachises densely clothed with fine grey pubescence, the latter with several glands. *Pinnæ* 1–2 in. long; leaflets ⅛–⅙ in., grey-green, more or less downy, membranous or subcoriaceous. Developed spines 1–2 in. long, spreading, brown, not white. *Heads* purple, ½ in. diam.; peduncles stout, densely downy, with a medial involucre. *Calyx* $\frac{1}{24}$ in., funnel-shaped, grey-downy. *Corolla* subcylindrical, twice the length of the calyx. *Pod* 4–6 in. by ½ in., short-stalked, 6–10-seeded.

7. **A. leucophlæa,** *Willd.*; *DC. Prodr.* ii. 462; pinnæ 12–24, leaflets 30–60, heads in ample terminal panicles, pod narrow ligulate falcate thin flat tomentose with straight sutures. *Wall. Cat.* 5261; *W. & A. Prodr.* 277; *Dalz. & Gibs. Bomb. Fl.* 86; *Bedd. Fl. Sylv.* t. 48. A. alba, *Willd.*; *DC. loc. cit.* A. arcuata, *Decaisne Herb. Timor. Descr.* 133. Mimosa leucophlæa, *Roxb. Cor. Pl.* t. 150; *Fl. Ind.* ii. 558. Mimosa alba, *Rottl. in Nov. Act. Ber.* 1803, 208.

NORTH WEST provinces to CEYLON and BIRMA.—DISTRIB. Malay isles, Timor.

Easily recognisable from all the foregoing by its panicled inflorescence. *Spines* ⅛–1 in., white. *Leaf*-rachises downy, with several glands; pinnæ 1–1½ in. long; leaflets crowded, rigidly coriaceous, ⅛–⅙ in. *Panicle* reaching a foot long and broad, with long compound densely tomentose ascending branches, the lower only from leafy nodes; heads yellow, not more than ¼ in. diam.; peduncles with the bract medial, the upper very short. *Corolla* under $\frac{1}{24}$ in. *Pod* 4–8 in. by ¼–⅓ in., sessile, subindehiscent, clothed with pale brown or grey persistent tomentum.

VAR. *microcephala*, Grah. in Wall. Cat. 5263, sp.; leaf-rachis glabrous, leaflets much larger ¼–⅜ in. long. A. densa, *Wall. Cat.* 5262.—Birma, *Wallich.*

SERIES II. **Gummiferæ spicatæ.** Erect trees. *Spines* short and hooked, except in *A. Latronum*. *Stipules* spinescent. *Flowers* in peduncled spikes in the axils of the leaves.

8. **A. Suma,** *Kurz in Brand. For. Fl.* 187; spines in pairs short hooked, pinnæ 20–40, leaflets 60–100 small ligulate, rachises densely downy, corolla scarcely exceeding the canescent calyx, pod strap-shaped straight. *Benth. in Linn. Trans.* xxx. 519. A. Catechu, *W. & A. Prodr.* 272 (*excl. syn.*); *Benth. in Hook. Lond. Journ.* 1842, 510; *Dalz. & Gibs. Bomb. Fl.* 86; *Bedd. Fl. Sylv.* t. 49. A. Sundra, *Wall. Cat.* 5227. Mimosa Suma, *Roxb. Hort. Beng.* 41; *Fl. Ind.* ii. 563. Mimosa frondosa and tamariscina, *Heyne MSS.* M. albida, *Roxb. MSS.*

BENGAL, BEHAR, WESTERN PENINSULA, CEYLON.

A middle-sized tree, with white bark and downy branchlets. *Leaf*-rachis ½ ft. long, with a large basal gland and smaller ones between several of the upper pinnæ; pinnæ 1½–2 in. long; leaflets very close, rigidly subcoriaceous, pale green, under ¼ in. long. *Spikes* 1–4-nate, 3–4 in. long. *Calyx* $\frac{1}{16}$–$\frac{1}{12}$ in., densely grey-downy;

teeth deltoid. *Corolla* nearly white. *Pod* 3-4 in. by ½–¾ in., rather thicker than in the two following, veined, 6–8-seeded, distinctly beaked, subindehiscent, narrowed suddenly into a stalk ½–¾ in. long.

9. **A. Catechu,** *Willd. Sp. Pl.* iv. 1079; spines short hooked in pairs, pinnæ 40–80, leaflets 60–100 small ligulate, rachises downy, corolla 2–3 times the tomentose calyx, pod strap-shaped straight. *Wall. Cat.* 5228, A, B, C, F. Acacia catechuoides, *Wall. Cat.* 5229 *A in part*; *Benth. in Hook. Lond. Journ.* 1842, 510. A. polyacantha, *Willd. Sp.* iv. 1079? A. Wallichiana, *DC. Prodr.* ii. 458? Mimosa Catechu, *Roxb. Cor. Pl.* t. 175; *Ker. Med. Obs.* v. 151, t. 4; *Roxb. Hort. Beng.* 41; *Fl. Ind.* ii. 563 (*both* No. 41 and 42). Mimosa catechuoides, *Roxb. Fl. Ind.* ii. 562.

Through the Himalayas from the PUNJAB to SIKKIM, ascending to 4–5000 ft. BIRMA.

Very near *A. Suma*, from which it differs by its brown bark, darker yellow flowers, calyx not more than half as long, both absolutely and in proportion to the corolla, and not merely downy, but clothed with distinct spreading grey hairs, and by its narrower thinner darker brown pod.

10. **A. Sundra,** *DC. Prodr.* ii. 458; spines short hooked in pairs, pinnæ 30–40, leaflets 40–80 small ligulate, rachises glabrous, corolla 3 times the glabrous calyx, pod strap-shaped straight. *W. & A. Prodr.* 273; *Dalz. & Gibs. Bomb. Fl.* 86; *Bedd. Fl. Sylv.* t. 50. A. chundra, *Willd. Sp.* iv. 1078. A. catechuoides, *Wall. Cat.* 5229 *A, ex parte*. A. Catechu, *Brand. For. Flor.* 186, *et Benth. in Trans. Linn. Soc.* xxx. 519, *in part*. Mimosa Sundra, *Roxb. Cor. Pl.* t. 225; *Hort. Beng.* 41; *Fl. Ind.* ii. 562.

WESTERN PENINSULA, CEYLON, BIRMA.

Scarcely more than a variety of *A. Catechu*, from which it differs by its fewer leaflets and pinnæ, and by the total absence of pubescence from the leaflets leaf-rachises and calyx, by the latter being rather shorter, and by the very dark brown colour of its branchlets.

11. **A. ferruginea,** *DC. Prodr.* ii. 458; spines short hooked in pairs, pinnæ 6–12, leaflets 20–40 ligulate-oblong, rachises glabrous, corolla 2–3 times the campanulate glabrous calyx, pod straight strap-shaped. *Wall. Cat.* 5226; *W. & A. Prodr.* 273; *Bedd. Fl. Sylv.* t. 51. Mimosa ferruginea, *Roxb. Hort. Beng.* 41; *Fl. Ind.* ii. 561.

WESTERN PENINSULA.

A middle-sized tree, with brown bark and glabrous or slightly downy branchlets. *Prickles* sometimes suppressed. *Leaf*-rachis with a gland on the petiole and one between the uppermost pinnæ; pinnæ 2–3 in. long; leaflets ¼–⅓ in. long, pale glaucous-green, rigidly subcoriaceous. *Spikes* dense, 3–4 in. long. *Corolla* yellowish, $\frac{1}{12}$ in. *Pod* 3–4 in. long, ¾ in. broad, dark brown, glabrous, veined, distinctly stalked, 4–6-seeded, the upper suture narrowly winged.

12. **A. Senegal,** *Willd.*; *DC. Prodr.* ii. 459 *in part*; spines small hooked often 3-nate, pinnæ 6–10, leaflets 16–28 small ligulate, rachises finely downy, corolla twice the campanulate calyx, pod straight strap-shaped. A. Verek, *Guill. & Per. Fl. Seneg.* i. 245, t. 56. A. rupestris, *Stocks*; *Boiss. Fl. Orient.* ii. 638.

SCINDE, *Stocks*.—DISTRIB. Arabia, tropical Africa.

A low tree, with flexuose glaucous grey branches. *Leaf*-rachises not above an inch long, with a gland at the base and one between the upper pair of pinnæ; leaflets rigidly subcoriaceous, ⅛ in. long, glabrous, pale, glaucous-green. *Spikes* 2–3 in. long.

not very dense. *Calyx* $\frac{1}{24}$ in., campanulate, glabrous, deeply toothed. *Corolla* yellowish. *Pod* 3 in. by $\frac{3}{4}$ in., thin, grey, firm, indehiscent, 5–6-seeded, narrowed suddenly into a short stalk.

13. **A. modesta,** *Wall. Pl. As. Rar.* t. 130; spines in pairs short hooked, pinnæ 4–6, leaflets 6–8 obovate, corolla twice the glabrous campanulate calyx, pod straight strap-shaped. *Wall. Cat.* 5230; *Dcne. in Jacquem. Voy. Bot.* t. 56. Mimosa dumosa, *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 559. M. obovata, *Roxb. Fl. Ind.* ii. 561.

Foot of the WESTERN and CENTRAL HIMALAYAS.—DISTRIB. Afghanistan.

A middle-sized tree, with grey glabrous branches. *Prickles* dark-brown, polished. *Leaf*-rachises very slender, finely downy, with a small gland at the base and one between the uppermost pinnæ; leaflets thin, rigidly subcoriaceous, $\frac{1}{8}$–$\frac{3}{8}$ in. long, shortly stalked, glabrous, oblique at the base, pale green, obtuse or minutely cuspidate. *Spikes* 2–3 in. long, not very dense. *Corolla* $\frac{1}{12}$ in., greenish. *Pod* 2–3 in. by $\frac{3}{8}$–$\frac{5}{8}$ in., 6–8-seeded, glossy, drab, glabrous, venulose, narrowed gradually into a short stalk.

14. **A. lenticularis,** *Ham. in Wall. Cat.* 5244; spines in pairs short hooked, pinnæ 4–8, leaflets 12–16 large obovate-oblong, corolla twice the campanulate calyx, pod strap-shaped straight or subfalcate. *Benth. in Hook. Lond. Journ.* i. 508.

Foot of CENTRAL and EASTERN and WESTERN HIMALAYAS, rare, *Hamilton, Royle.*

Branches grey, glabrous. *Leaves* long-petioled, without any gland on the rachis; pinnæ 3–4 in. long; leaflets much larger than in any other species, 1–1$\frac{1}{4}$ in. long, obtuse, pale glaucous-green, glabrous, rigidly subcoriaceous, sessile, reduced on the upper side towards the base. *Spikes* very dense, short-peduncled, 3–4 in. long. *Corolla* $\frac{1}{8}$ in., grey, campanulate, deeply toothed. *Pod* 6–8 in. by $\frac{3}{4}$ in., 6–9-seeded, thin, flat, opaque, brown, venulose, with both sutures slightly thickened and furnished with a narrow wing.

15. **A. Latronum,** *Willd.*; *DC. Prodr.* ii. 460; spines in pairs long straight, pinnæ 6–10, leaflets 20–30 minute ligulate, pod oblong thin flat rather recurved. *Bedd. Fl. Sylv.* 95; *Wall. Cat.* 5332; *Wight Ic.* t. 1157; *W. & A. Prodr.* 273; *Dalz. & Gibs. Bomb. Fl.* 87. A. umbraculata, *Wall. Cat.* 5245. A. dumosa, *W. & A. Prodr.* 274, *excl. syn. Roxb.* Mimosa Latronum, *Linn.*; *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 558. M. cornigera, *Linn. Suppl.* 438.

WESTERN PENINSULA.

A low tree, forming an umbrella-like top when old, with brown glabrous branches. Full-sized *prickles* 2–2$\frac{1}{2}$ in. long, $\frac{1}{4}$–$\frac{3}{8}$ in. thick, connate at the base. *Leaves* shorter than the prickles; rachises very slender, glabrous or downy, with a small petiolar gland; leaflets $\frac{1}{8}$–$\frac{1}{4}$ in., glabrous, rigidly subcoriaceous. *Spikes* abundantly produced from the close nodes of leafless branches. *Corolla* $\frac{1}{12}$ in., 3–4 times the minute glabrous campanulate calyx. *Pod* 1$\frac{1}{2}$–2 in. by $\frac{1}{2}$–$\frac{3}{4}$ in., opaque, dark brown, 2–4-seeded, veined, finally dehiscing.

SERIES III. **Vulgares.** Climbers with copious scattered prickles. *Flowers* in copiously panicled globose heads.

16. **A. concinna,** *DC. Prodr.* ii. 464; pinnæ 12–16, leaflets 30–50 membranous, stipules and bracts cordate-ovate, pod thick succulent when dry shrivelled and rugose with slightly waved sutures. *W. & A. Prodr.* 277; *Wall. Cat.* 5250, *excl. D*; *Dalz. & Gibs. Bomb. Fl.* 87. A. Hooperiana, *Zippel.*; *Miq. Fl. Ind. Bat* i. 10. Mimosa concinna, *Willd.*; *Roxb. Hort. Beng.* 41; *Fl. Ind.* ii. 565. M. rugata, *Lam.*; *DC. Prodr.* ii. 431. M. abstergens, *Spreng. DC. Prodr. loc. cit.*

EASTERN HIMALAYAS, WESTERN and EASTERN PENINSULAS, and CEYLON.—DISTRIB. Malay isles, China.

Prickles abundant, minute, hooked. *Branchlets* and leaf-rachises finely grey-downy. *Petiole* with a large gland near the base and one between the uppermost pinnæ; pinnæ 2–3 in. long; leaflets $\frac{3}{8}$–$\frac{1}{2}$ in. long, pale green above, glaucous beneath, subglabrous, $\frac{1}{12}$–$\frac{1}{8}$ in. broad, with a very oblique midrib, sensitive, often not crowded. *Panicles* with densely downy branches, the lower springing from the axils of the leaves, the upper subtended by conspicuous oblique membranous subpersistent bracts; heads yellow, $\frac{3}{8}$–$\frac{1}{2}$ in. broad. *Calyx* funnel-shaped, $\frac{1}{12}$ in. long. *Corolla* little exserted. *Pod* strap-shaped, straight, 3–4 in. by $\frac{3}{4}$ in., 6–10-seeded, with broad sutures, narrowed to a short stalk, depressed between the seeds.

VAR. *rugata*, Ham. in Wall. Cat. 5251, sp.; leaflets and pod larger, the pinnæ $\frac{1}{8}$ in. and the latter 1–1$\frac{1}{4}$ in. broad, ovary villose.—Eastern Himalayas.

17. **A. Intsia,** *Willd. in DC. Prodr.* ii. 464; pinnæ 12–16, leaflets 16–24 ligulate-oblong rigidly subcoriaceous not crowded, bracts minute lanceolate, pod dry thin. *Wall. Cat.* 5248; *W. & A. Prodr.* 278; *Dalz. & Gibs. Bomb. Fl.* 88. Mimosa cæsia, *Linn. Sp. Pl.* 1507, *ex parte.* M. Intsia, *Linn.*; *Roxb. Hort. Beng.* 41; *Fl. Ind.* ii. 565.

Tropical HIMALAYAS, WESTERN PENINSULA, EASTERN PENINSULA, and CEYLON.

Prickles minute, hooked. *Branchlets* and leaf-rachises finely downy or glabrous, the latter with a gland at the base and between the 2-3 upper pinnæ. *Pinnæ* 2–3 in. long; leaflets $\frac{1}{8}$–$\frac{1}{5}$ in., broad, minutely cuspidate, with the midrib nearer the upper margin, both surfaces glabrous or nearly so, the lower grey-green. *Peduncles* finely downy, 1–4-nate; heads yellow, under $\frac{1}{2}$ in. broad. *Calyx* shorter, and more broadly funnel-shaped than in the last. *Pod* straight, strap-shaped, glabrous, dehiscent, smooth, 4–6 in. by $\frac{3}{4}$–1$\frac{1}{4}$ in., 8–12-seeded, the sutures straight or slightly repand, cuneately narrowed at the base to a short stalk.

VAR. *cæsia*, W. & A. Prodr. 278, sp.; leaflets 40–60 crowded not more than $\frac{1}{12}$–$\frac{1}{8}$ in., broad rigidly subcoriaceous obtuse with a minute cusp, pinnæ 16–30. A. Arar, *Ham. in Wall. Cat.* 5249. A. alliacea, *Ham. in Wall. Cat.* 5258. A. intsioides, *DC. Prodr.* ii. 464. A. pseudo-intsia, *Miq. Fl. Ind. Bat.* i. 12. Mimosa cæsia, *Linn. ex parte*; *Roxb. Fl. Ind.* ii. 565. M. tenuifolia, *Roxb. Hort. Beng.* 41.—Himalayas (ascending to 3000 ft. in the West and 5000 in Sikkim) Behar, Western Peninsula, Birma.—Distrib. Malay isles.

VAR. *oxyphylla*, Grah. in Wall. Cat. 5252, sp.; leaflets 40–50 more membranous than in the last and more acutely pointed.—Eastern Himalayas.

18. **A. pennata,** *Willd. Sp. Pl.* iv. 1090; pinnæ 16–30, leaflets 80–100 rigidly coriaceous very narrow densely crowded, bracts minute lanceolate, pod dry thin. *Wall. Cat.* 5254; *W. & A. Prodr.* 277. Acacia megaladena, *Desv.*; *DC. Prodr.* ii. 465. A. prensans, *Lowe in Bot. Mag.* t. 3408. A. paludosa, *Miq. Flor. Ind. Bat.* i. 14. A. pinnata, *Dalz. & Gibs. Bomb. Fl.* 87. Mimosa pennata, *Linn. Sp.* 1507, *excl. syn.*; *Roxb. Fl. Ind.* ii. 565. M. torta, *Roxb. Hort. Beng.* 41; *Fl. Ind.* ii. 566. M. ferruginea, *Rottl.*; *DC. Prodr.* ii. 431.

CENTRAL and EASTERN HIMALAYAS (ascending to 5000 ft.), BEHAR, EASTERN and WESTERN PENINSULA, BIRMA, and CEYLON.—DISTRIB. Malay isles, Trop. Africa, Natal.

Prickles generally fewer and less hooked than in *A. Intsia* and *concinna*. *Branchlets* and leaf-rachises finely downy, the latter with a large plate-shaped gland at the base of the petiole and several between the upper pinnæ. *Pinnæ* 2–3 in. long; leaflets firm in texture, not more than $\frac{1}{36}$–$\frac{1}{24}$ in. broad, dark green above, grey-green below, both sides glabrous. *Peduncles* 1–4-nate, finely downy; heads $\frac{1}{2}$ in. thick. *Corolla* $\frac{1}{12}$ in., slightly exceeding the glabrous subcampanulate calyx. *Pod* straight, strap-shaped, thin glabrous, dehiscent, 6–8 in. by $\frac{3}{4}$–1$\frac{1}{4}$ in., distinctly stalked, 8–12-seeded, the sutures rather raised, slightly repand.

VAR. 1. *canescens*, Grah. in Wall. Cat. 5256, sp.; branches and leaf-rachises densely pubescent, leaflets slightly downy below. A. cæsia, *Wall. Cat.* 5253 A. A. amblycarpa, *Grah. in Wall. Cat.* 5260. A. concinna, *Wall. Cat.* 5250 D? A. tomentella, *Zipp.*; *Miq. Fl. Ind. Bat.* i. 13.

VAR. 2. *arrophula*, Don; Wall. Cat. 5257, sp.; pinnæ more numerous, leaflets duller in colour and not so firm in texture, panicle more elongated and compound, peduncles often 4–6-nate.—Eastern Himalayas.

VAR. 3. *pluricapitata*, Steud.; Benth. in Hook. Lond. Journ. Bot. 1842, 516, sp.; pinnæ 40–80 not more than 1¼–1½ in. long, leaflets very narrow and crowded, petiolar glands much smaller, panicle elongated sometimes a foot long above the leaves, peduncle often 6–8-nate, heads smaller, A. polycephala, *Grah. in Wall. Cat.* 5255, *non DC.*—Martaban, Penang, and Malacca.—Distrib. Malay isles.

IMPERFECTLY KNOWN SPECIES.

A. WIGHTII, *Baker*. In Dr. Wight's collection are specimens without fruit of a well-marked species near *A. arabica*, from Travancore and Tinnevelly, with glabrous branchlets and leaf-rachises, large straight dark-brown spines, 2–8 pinnæ, 12–32 oblique oblong glabrous subcoriaceous leaflets ¼–⅜ in. long, short glabrous 2–4-nate peduncles with the involucre below the middle, funnel-shaped shortly-toothed calyx ⅛ in. long, and a minute campanulate glabrous calyx.

128. **ALBIZZIA**, Durazz.

Large trees. *Leaves* bipinnate. *Flowers* in the Indian species in globose heads, sessile or pedicellate, usually pentamerous and all hermaphrodite. *Calyx* campanulate or funnel-shaped, distinctly toothed. *Corolla* funnel-shaped, petals firmly united below the middle. *Stamens* indefinite, monadelphous at the base, filaments several times the length of the corolla; anthers minute, not gland-crested. *Ovary* sessile or shortly-stalked; style filiform, stigma capitate minute. *Pod* large, thin, flat, strap-shaped, straight, indehiscent or subindehiscent, continuous within, the sutures not thickened.—DISTRIB. Species 25–30, spread through the Tropics of the Old World.

The Australian *A. lophantha*, which resembles *A. amara* in the leaves but has the flowers in spikes, is naturalised on the Nilghiris.

* *Leaflets oblong, at least ¼–⅓ in. broad.*

1. **A. Lebbek,** *Benth. in Hook. Lond. Journ.* 1844, 87; leaflets 8–18, obtuse, heads not panicled, calyx pedicellate funnel-shaped. *Dalz. & Gibs. Bomb. Fl.* 88; *Bedd. Fl. Sylv.* t. 53; *Boiss. Fl. Orient.* ii. 639. Acacia Lebbek, *Willd.*; *DC. Prodr.* ii. 466. A. speciosa, *Willd.*; *DC. Prodr.* ii. 467; *W. & A. Prodr.* 275. Mimosa speciosa, *Jacq. Ic.* t. 198. Acacia Sirissa, *Ham. in Wall. Cat.* 5265. Mimosa Sirissa, *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 544. Albizzia latifolia, *Boivin*; *Miq. Fl. Ind. Bat.* i. 22.

Tropical HIMALAYAS, ascending to 5000 ft. in the Central Provinces and 4000 ft. in KHASIA; through INDIA PROPER and CEYLON to BIRMA and TENASSERIM.—DISTRIB. Malay isles, China, N. Australia, Trop. Africa.

A tall tree, without prickles. *Leaves* with glabrous or downy rachises, and a large gland near the base of the main petiole; pinnæ 4–8, with or without a gland between the lowest; leaflets short-stalked, rigidly subcoriaceous, oblique, 1–1½ in. long, glabrous or finely grey-downy. *Heads* many-flowered, short-peduncled, 3–4 together from the crowded upper nodes on downy erecto-patent peduncles. *Calyx* ⅛ in., downy. *Corolla* greenish-yellow, twice the calyx, the teeth short, lanceolate. *Pod* strap-shaped, firm, yellow-brown, ½–1 ft. by ¾–1½ in., 6–10-seeded.

2. **A. pedicellata,** *Baker*; leaflets 36–40 obtuse, heads not panicled, calyx pedicellate funnel-shaped. *Benth. in Trans. Linn. Soc.* xxx. 563.

MALACCA, *Maingay.*

Combines the leaves of *A. odoratissima* with inflorescence of *A. Lebbek. Leaves* with a gland near the base of the main petiole; rachises and leaflets finely downy; pinnæ 12–18; leaflets oblong, obtuse, sessile, rigidly subcoriaceous, little oblique, $\frac{1}{2}$–$\frac{3}{4}$ in. long. *Heads* many-flowered, on crowded downy peduncles from the upper nodes. *Pedicels* and calyx each $\frac{1}{8}$–$\frac{1}{6}$ in., densely pubescent. *Corolla* half as long again as the calyx. *Pod* a foot or more by 2 in., very thin and brittle, pale yellowish-brown, with repand sutures and very small seeds.

3. **A. odoratissima,** *Benth. in Hook. Journ. Bot.* 1844, 88; leaflets 16–40 sessile obtuse very oblique, heads copiously panicled, calyx sessile minute campanulate. *Dalz. & Gibs. Bomb. Fl.* 88; *Bedd. Fl. Sylv.* t. 54. Acacia odoratissima, *Willd.*; *DC. Prodr.* ii. 466; *Wall. Cat.* 5234; *W. & A. Prodr.* 275. A. lomatocarpa, *DC. Prodr.* ii. 467. A. micrantha, *Boiv.*; *Miq. Fl. Ind. Bat.* i. 24. Mimosa odoratissima, *Linn.*; *Roxb. Cor. Pl.* t. 120; *Hort. Beng.* 40; *Fl. Ind.* ii. 546. M. marginata, *Lam. Dict.* i. 12. A. lebekkoides, *Benth. loc. cit.* p. 89?

Foot of the CENTRAL HIMALAYAS to CEYLON and MALACCA.

A tall erect tree, without prickles. *Leaf*-rachises finely downy, with a gland at the base of the petiole and of the 1–2 upper pinnæ; pinnæ 6–8; leaflets obliquely oblong, articulated on the rachis, $\frac{3}{4}$–1 in. long, rigidly subcoriaceous, glaucous beneath, strongly veined, with the midrib parallel with the upper edge at a short distance from it. *Heads* small, few-flowered, very numerous, forming ample deltoid terminal panicles crowded in peduncled corymbs at the end of the branches and smaller ones from the upper leaf-axils. *Calyx* under $\frac{1}{24}$ in. *Corolla* grey-silky $\frac{1}{6}$ in., with lanceolate teeth. *Pod* firm, flexible, 6–8 in. by 1–1$\frac{1}{2}$ in., opaque or glossy, 8–12-seeded. We have not material for separating from this *A. lebekkoides*, Benth., reported by Kurz from Birma.

VAR. *mollis*, Benth.; leaflets and leaf-rachises densely grey-downy, the former less rigid than in the type.—Rohilcund, *Thomson*. Siwaliks, *Edgeworth*.

4. **A. procera,** *Benth. in Hook. Journ.* 1844, 89; leaflets 12–24 short-stalked obtuse, heads copiously panicled, calyx sessile funnel-shaped. *Bedd. Fl. Sylv.* 96. Acacia procera, *Willd.*; *DC. Prodr.* ii. 466. Mimosa procera, *Roxb. Cor.* t. 121; *Fl. Ind.* ii. 548.

CENTRAL and EASTERN HIMALAYAS, BEHAR, WESTERN PENINSULA, BIRMA.—DISTRIB. Malay isles, Philippines.

Leaf-rachises glabrescent, with a large gland near the base of the petiole; pinnæ 4–12; leaflets rigidly subcoriaceous, grey beneath, glabrous, 1–1$\frac{1}{2}$ in. long, obliquely truncate on the lower side at the base. *Inflorescence* like that of *A. odoratissima. Calyx* $\frac{1}{12}$ in., shortly toothed. *Corolla* twice the length of the calyx, deeply cleft. *Pod* 4–8 in. by $\frac{1}{2}$–1 in., thin, brown, glabrous, finally dehiscing, 8–12-seeded.

VAR. *elata*, Baker; leaflets smaller $\frac{1}{2}$–$\frac{3}{4}$ in. long less oblique at the base. Mimosa elata, *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 546. Acacia elata, *Grah. in Wall. Cat.* 5233.

5. **A. lucida,** *Benth. in Hook. Journ. Bot.* 1844, 86; *Pl. Jungh.* i. 268; leaflets 2–4 rarely 6 large acute, heads copiously panicled, calyx minute sessile campanulate. Mimosa lucida, *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 544. Inga lucida, *Wall. Cat.* 5267, *excl. B. et F. pro parte.*

NIPAL, KHASIA, ASSAM, SILHET, AVA, and SINGAPORE.

Differs widely from all the other species except the next, by its large acute leaflets and unijugate pinnæ. Main and partial *petiole* each with usually a large gland. *Leaflets* oblong, 2–4 in. long, glabrous, membranous, firm, bright green. Ultimate

branches of the *panicle* umbellate or corymbose. *Calyx* $\frac{1}{24}$ in., faintly-toothed. *Corolla* 3–4 times the length of the calyx; teeth lanceolate. *Pod* 6–8 in. by 1–1½, thin, flexible, pale brown, 6–8-seeded.

6. **A. glomeriflora,** *Kurz in Journ. Asiat. Soc. Beng.* xlii. 2, 74; leaflets usually 6 rarely 4 middle-sized acute, heads copiously panicled, calyx minute sessile campanulate. *Benth. in Trans. Linn. Soc.* xxx. 560.

MARTABAN, *Kurz.*

A shrub, 2–5 ft. high, with puberulous branchlets. *Pinnæ* unijugate; leaflets oblong- or subrhomboidal-lanceolate, 1–2 in. long, chartaceous, nearly glabrous above when mature, glaucescent and downy beneath. *Heads* the size of a pea, in axillary racemes and terminal panicles. *Calyx* under $\frac{1}{24}$ in., pubescent. *Corolla* thrice as long as the calyx, deeply lobed, pubescent, greenish-white. *Pod* unknown. *Ex Kurz loc. cit.*

** *Leaflets narrow, dimidiate-lanceolate, with the midrib close to the upper edge.*

7. **A. Julibrissin,** *Durazz.*; *Benth. in Hook. Journ. Bot.* 1844, 91; leaflets 20–50, stipules and bracts caducous, heads of flowers not panicled, corolla three times as long as the calyx. *Boiss. Fl. Orient.* ii. 639. Acacia Julibrissin and Nemu, *Willd.*; *DC. Prodr.* ii. 469. Mimosa Kalkora, *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 547? M. arborea, *Thunb. Fl. Jap.* 229.

Throughout the Himalayas from HAZARA to SIKKIM, ascending to 6–7000 ft.—DISTRIB. Abyssinia, Eastern and Central Asia, China, Japan.

A middle-sized unarmed tree. *Leaf*-rachises finely downy, with a small gland at the base of the petiole, and between the upper pinnæ; pinnæ 8–24; leaflets membranous, sessile, sensitive, ¼ in. long, cuspidate, straight on the upper side, rounded on the lower, ⅛ in. broad. *Heads* globose, on clustered erecto-patent peduncles from the crowded leafless upper nodes. *Calyx* ⅛–⅙ in., funnel-shaped, shortly toothed. *Filaments* rose-red, 1 in. *Pod* glabrous, membranous, grey or pale brown, 5–6 in. by ¾–1 in., 8–12-seeded, narrowed to a beak and short stalk, indehiscent.

VAR. *mollis*, Benth.; leaflets broader (⅙–¼ in,) more coriaceous, like the peduncles and calyx densely pubescent. Acacia mollis, *Wall. Pl. As. Rar*, ii. 76, t. 177; *Cat.* 5235.—Simla to Nipal.

8. **A. stipulata,** *Boiv.*; *Benth. in Hook. Journ. Bot.* 1844, 92; leaflets 40–80, stipules and bracts persistent, heads of flowers panicled, corolla twice the calyx. *Dalz. & Gibs. Bomb. Fl.* 88; *Bedd. Fl. Sylv.* t. 55. Acacia stipulata, *DC. Prodr.* ii. 469; *Wall. Cat.* 5236; *W. & A. Prodr.* 274. A. Smithiana, *Wall. Cat.* 5237. A. marginata, *Ham. in Wall. Cat.* 5243. Mimosa stipulacea, *Roxb. Fl. Ind.* ii. 549. M. Smithiana, *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 550. Arthrosprion stipulatum, *Hassk. Retz.* i. 212.

TROPICAL HIMALAYAS, ascending to 4000 ft. in KUMAON and SIKKIM, to CEYLON and BIRMA.—DISTRIB. Malay isles.

A tall unarmed tree, with finely grey downy branchlets. *Leaves* with many glands on the rachis; pinnæ 12–40; leaflets $\frac{1}{12}$ in. or less broad, membranous, sensitive, ¼–⅓ in., sessile, glaucous beneath, finely downy, with a slightly recurved acute point. *Stipules* and bracts large, membranous, downy, cordate, acute. *Heads* in copious axillary simple and compound terminal racemes with densely pubescent erecto-patent branches. *Calyx* like that of A. Julibrissin, but smaller. *Pod* 5–6 in. by ¾–1 in., pale brown, thin, indehiscent, subsessile, 8–10-seeded.

*** *Leaflets very narrowly strap-shaped with a central midrib.*

9. **A. myriophylla,** *Benth. in Hook. Journ.* 1844, 90; leaflets 80–100

rigidly subcoriaceous, heads panicled stipules persistent subspinescent, pod subsessile. Mimosa microphylla, *Roxb. Fl. Ind.* ii. 549. Acacia myriophylla, *Grah. in Wall. Cat.* 5242.

EASTERN HIMALAYAS, ascending to 3000 ft. in SIKKIM. SILHET, ASSAM, and the KHASIA MTS.—DISTRIB. Siam.

A low tree, with dark brown shoots, *Leaf*-rachises finely downy, with a large gland on the petiole, and several between the upper pinnæ; pinnæ 30–40, not more than 2–3 in. long; leaflets green, closely crowded, caducous, $\frac{1}{8}$–$\frac{1}{6}$ in. by $\frac{1}{24}$ in. *Heads* small, corymbose, forming an ample terminal panicle, with brown-tomentose branches. *Calyx* sessile, campanulate, under $\frac{1}{24}$ in. long. *Corolla* funnel-shaped, $\frac{1}{8}$–$\frac{1}{6}$ in. *Pod* 4–5 in. by $\frac{3}{4}$–1 in., glossy, brown, thin, flexible, 6–8-seeded, narrowed to both ends.

VAR. *foliolosa*; leaflets large $\frac{1}{4}$–$\frac{3}{8}$ in. long nearly $\frac{1}{12}$ in. broad, rachises less pubescent. Acacia foliolosa, *Grah. in Wall. Cat.* 5241.—Martaban, *Wallich.*

10. **A. amara,** *Boivin*; *Benth. in Hook. Journ. Bot.* 1844, 90: leaflets 30–60 membranous, stipules minute caducous, heads not panicled, pod distinctly stalked. *Dalz. & Gibs. Bomb. Fl.* 88; *Bedd. Fl. Sylv.* t. 61. Acacia amara, *Willd.*; *DC. Prodr.* ii. 469; *Wall. Cat.* 5238; *W. & A. Prodr.* 274. A. nellyrenza (nella-renga), *Grah. in Wall. Cat.* 5240. A. Wightii, *Grah. in Wall. Cat.* 5259; *W. & A. Prodr.* 274. Mimosa amara, *Roxb. Cor. Pl.* t. 122; *Hort. Beng.* 40; *Fl. Ind.* ii. 548. M. pulchella, *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 548. Inga ventricosa, *Grah. in Wall. Cat.* 5266, *ex parte.* Albizzia affinis, *Fourn. in Ann. Sc. Nat.* 4, xiv. 371.

WESTERN PENINSULA and CEYLON.—DISTRIB. Abyssinia (*A. sericocephala*, Benth.) and Kordofan.

A middle-sized unarmed tree, with densely pubescent branchlets and leaf-rachis, the latter with a small gland on the petiole and between the lowest pair of pinnæ. *Pinnæ* 8–20, 1–3 in. long; leaflets $\frac{1}{4}$–$\frac{1}{3}$ in. long, sessile, caducous, finely pubescent, grey or glaucous beneath. *Peduncles* copious, axillary, densely tomentose, crowded at the upper nodes in the axils of much-reduced leaves. *Calyx* $\frac{1}{24}$ in., funnel-shaped, shortly stalked. *Corolla* 3 times as long as the calyx; teeth lanceolate. *Pod* 6–9 in. by $\frac{3}{4}$–1 in., 6–10-seeded, opaque, grey-brown.

129. SERIANTHES, Benth.

Unarmed trees. *Leaves* bipinnate. *Flowers* racemed, much larger than in the other *Mimosæ*, 5-merous, mostly hermaphrodite. *Calyx* deeply campanulate, deeply toothed. *Petals* adnate at the base to the staminal tube, free above this. *Stamens* monadelphous, very numerous; anthers minute. *Ovary* sessile, many-ovuled; style filiform, stigma minute capitate. *Pod* large, oblong, sublignose, indehiscent, rather turgid.—DISTRIB. Another species in Polynesia.

1. **S. grandiflora** *Benth. in Hook. Lond. Journ. Bot.* 1844, 225. Inga grandiflora, *Wall. Cat.* 5285. I. Finlaysoniana, *Wall. Cat.* 5284. I. ventricosa, *Grah. in Wall. Cat.* 5266, *in part.*

MALACCA, *Griffith, Maingay.*—DISTRIB. Malay isles, Philippines.

Leaf-rachis with a gland on the common petiole and at the base of each pinna; pinnæ 6–16; leaflets 12–24, glossy green, glabrous, rigidly coriaceous, $\frac{1}{2}$–1 in. long, oblique, rather falcate, obtuse, with the upper and lower edge subparallel. *Flowers* shortly pedicellate, in few-flowered axillary corymbose panicles, which are shorter than the leaves. *Calyx* and yellowish corolla densely felted on the outside, the former $\frac{1}{2}$ in., the latter $1\frac{1}{2}$ in. long. *Stamens* many hundreds, much exserted.

Pod ½ ft. by 2 in., glabrous, 6–8-seeded, rather turgid, the sutures neither lobed nor thickened.

130. **CALLIANDRA,** Benth.

Shrubs or trees. *Leaves* bipinnate, with small or large leaflets. *Flowers* in globose heads, polygamous, 5-merous. *Calyx* campanulate, toothed. *Corolla* funnel-shaped, deeply 5-cleft. *Stamens* indefinite, monadelphous at the base, filaments filiform much exserted; anthers minute, not gland-crested. *Ovary* stalked, many-ovuled; style filiform, stigma minute capitate. *Pod* strap-shaped, slightly falcate, flat, rigidly coriaceous, the valves dehiscing with elasticity, bordered by much-thickened sutures, continuous within, narrowed gradually to a short stalk.—DISTRIB. Species 80, all the rest Tropical American.

1. **C. Griffithii,** *Benth. in Trans. Linn. Soc.* xxx. 537; spines minute, bracts linear-lanceolate.

KHASIA MTS., *Griffith.*

Branches slender, terete, glabrous. General and partial *petioles* very short, glandless. *Leaves* as in *C. umbrosa*; upper pair of leaflets connivent, oblong-lanceolate, oblique, acuminate, 2–3 in. long, rigidly subcoriaceous, glabrous, strongly veined, lower nearly sessile, ¼–½ in. *Heads* dense, on slender glabrous ascending peduncles 1–2 in. long, from the axils of developed leaves. *Calyx* $\frac{1}{12}$ in., funnel-shaped; teeth deltoid. *Corolla* funnel-shaped, glabrous, ⅜ in.; teeth lanceolate. *Pod* unknown.

2. **C. umbrosa,** *Benth. in Gen. Plant.* i. 597; spines conspicuous, bracts minute deltoid. Inga umbrosa, *Wall. Pl. Asiat. Rar.* t. 124; *Cat.* 5273. Albizzia umbrosa, *Benth. in Hook. Lond. Journ. Bot.* iii. 86.

SILHET, KHASIA MTS., CHITTAGONG, and PENANG.

A tree, with slender glabrous branchlets, sometimes furnished with small erecto-patent stipular spines. *Leaves* short; pinnæ 2, with a pair of large sessile oblique oblong acute rigidly subcoriaceous leaflets at the apex, and an odd much smaller one below on the outer side, all with a gland on the rachis at the base. *Flowers* sessile, in small dense globose heads on short ascending peduncles. *Corolla* ⅛ in., yellow, inodorous. *Pod* 6–9 in. by ¾–1 in. broad, smooth, finely veined, the valves with elevated rounded thick raised edges.

131. **PITHECOLOBIUM,** Mart.

Erect trees. *Leaves* bipinnate. *Flowers* in globose heads, usually hermaphrodite and pentamerous. *Calyx* campanulate or funnel-shaped, shortly toothed. *Corolla* funnel-shaped, the petals united below the middle. *Stamens* monadelphous, much exserted; anthers not gland-crested. *Ovary* sessile or stalked, many-ovuled; style filiform, stigma minute capitate. *Pod* strap-shaped, falcate or circinate, usually dehiscent and much twisted in a late stage, the sutures not thickened.—DISTRIB. Species about 100, cosmopolitan in the Tropics, mostly American, only one African.

SERIES I. **Unguiscati.** Stipules spinose.

1. **P. dulce,** *Benth. in Hook. Lond. Journ.* 1844, 199; pinnæ and leaflets 2, heads in long narrow terminal panicles, flowers sessile, pod coriaceous. *Bedd. Fl. Sylv.* t. 188. Mimosa dulcis, *Roxb. Cor. Pl.* t. 99; *Hort. Beng.* 40; *Fl. Ind.* ii. 556. Inga dulcis, *Willd.*; *DC. Prodr.* ii. 436; *Wall. Cat.* 5282; *W. & A. Prodr.* 268; *Wight Ic.* t. 198.

Cultivated throughout India, but not indigenous. A native of Trop. America.

A middle-sized tree, with glabrous leaves and branches. Spines minute, pointing upwards. *Leaflets* approximated, oblique, obovate-oblong, rigidly subcoriaceous, obtuse, 1–2 in. long. *Heads* dense, $\frac{3}{8}$–$\frac{1}{2}$ in. broad, shortly peduncled, on elongated branches. *Calyx* $\frac{1}{24}$ in., funnel-shaped, grey-downy. *Corolla* $\frac{1}{8}$ in. *Pod* 4–5 in. by $\frac{1}{2}$ in., 6–8-seeded, both sutures indented between the seeds, which are half enveloped in a pulpy white edible aril.

2. **P. geminatum,** *Benth. in Hook. Lond. Journ.* 1844, 202; spines large, pinnæ 2, leaflets 6–10, heads axillary, uppermost leaves much reduced, flowers sessile. *Bedd. Fl. Sylv.* 96. Inga geminata, *W. & A. Prodr.* 269. I. flexuosa, *Grah. in Wall. Cat.* 5286.

CEYLON and WESTERN PENINSULA.

A low tree, with slender pubescent branches. Common *petiole* very short, with a gland between the erecto-patent pinnæ; pinnæ 1–1$\frac{1}{2}$ in. long; leaflets bright green, rigidly subcoriaceous, uppermost pair approximated, $\frac{1}{2}$–$\frac{3}{4}$ in. long, obtuse, oblique-obovate; lower smaller, lowest on inside absent. *Peduncles* slender, pubescent. *Calyx* campanulate, under $\frac{1}{24}$ in. *Corolla* 3–4 times the length of the calyx. *Stamens* $\frac{1}{2}$ in. long. *Pod* not seen.

P. NITIDUM, *Benth. in Hook. Lond. Journ.* 1844, 202 (Mimosa nitida, *Vahl, Symb.* ii. 103. Acacia nitida, *Willd.*; *DC. Prodr.* ii. 460. Inga Kœnigii, *W. & A. Prodr.* 269), a plant unknown to recent botanists, is probably a form of this with 4 pinnæ.

3. **P. umbellatum,** *Benth. in Hook. Lond. Journ.* 1844, 202; spines minute, pinnæ 2–4, leaflets 6–20, heads axillary, flowers stalked, pod sublignose. *Bedd. Fl. Sylv.* 96. Inga umbellata, *Willd.*; *DC. Prodr.* ii. 439; *W. & A. Prodr.* 270. I. corcondiana, *DC. Prodr.* ii. 441; *Wall. Cat.* 5287. Mimosa umbellata, *Vahl, Symb.* ii. 103. M. concordiana, *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 556.

WESTERN PENINSULA and CEYLON.—DISTRIB. Malay isles.

A low tree, with the branchlets sometimes reduced to spines, but with the stipulary spines often small and obscure. *Leaf*-rachis downy, with a gland between the pinnæ and an obscure one between each pair of leaflets; leaflets subglabrous, rigidly coriaceous, ligulate-oblong, obtuse, $\frac{1}{2}$–1$\frac{1}{2}$ in. long, the uppermost pair broader upwards, the lowest on the inner side mostly absent. *Heads* long-peduncled, few-flowered. *Corolla* $\frac{1}{4}$ in., twice the length of the funnel-shaped calyx. *Stamens* $\frac{3}{4}$–1 in. *Pod* very different to those of the other species, recurvato-falcate, indehiscent, jointed, $\frac{1}{4}$–$\frac{1}{3}$ in. thick, 6–8-seeded.

SERIES II. **Clypearia.** Spineless trees with coriaceous twisted pods opening from the lower suture.

* *Leaflets few and but slightly oblique at the base.*

4. **P. bigeminum,** *Benth. in Hook. Lond. Journ.* 1844, 206; branchlets slightly pubescent, pinnæ 2–4, leaflets 4–6, leaves with glands on the petiole and at the base of each pinna and leaflet, calyx subcampanulate, pod not lobed. *Dalz. & Gibs. Bomb. Fl.* 89; *Bedd. Fl. Sylv.* 96. Mimosa bigemina, *Linn.*; *Vahl, Symb.* ii. 103. M. lucida, *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 544. M. monadelpha, *Roxb. Fl. Ind.* ii. 544? Inga bigemina, *Willd.*; *DC. Prodr.* ii. 439; *W. & A. Prodr.* 269. I. lucida, *Wall. Cat.* 5267 A. I. annularis, *Grah. in Wall. Cat.* 5269. I. Wightiana, *Grah. in Wall. Cat.* 5281.

EASTERN HIMALAYAS, ascending to 3000 ft., WESTERN PENINSULA and CEYLON.—DISTRIB. Malay isles, Philippines.

A tall tree, with subterete branchlets with thin brown pubescence. *Pinnæ* and leaves long-petioled; leaflets subcoriaceous, glabrous above, slightly pubescent at first

beneath, obovate-oblong, acute, the upper 4–6 in. long, the lower shorter, all distinctly stalked. *Heads* few-flowered, irregular, in copious ample axillary and terminal panicles. *Calyx* subsessile, $\frac{1}{16}$–$\frac{1}{12}$ in., densely brown-silky. *Corolla* silky, 2–3 times the length of the calyx. *Stamens* $\frac{3}{8}$–$\frac{1}{2}$ in. *Pod* once or twice spiral, 3–6 in. by $\frac{1}{2}$–$\frac{3}{4}$ in., the valves rigidly coriaceous, slightly downy, the lower suture not at all repand.

5. **P. affine,** *Baker*; branchlets densely pubescent, pinnæ 2, leaflets 6–8, leaves with glands on the petiole and at the base of the pinnæ and leaflets, calyx funnel-shaped, pod not lobed. *Benth. in Trans. Linn. Soc.* xxx. 577.

MALACCA, *Maingay*.

Very near *P. bigeminum*. *Branchlets* clothed with dense spreading brown tomentum. *Leaflets* 3–6 in. long, shortly-stalked, rigidly subcoriaceous, glabrous. *Calyx* $\frac{1}{8}$ in., densely brown-silky. *Corolla* twice the calyx, narrowly funnel-shaped, shortly toothed, densely silky. *Valves* of the pod more rigid than in *P. bigeminum*, $\frac{3}{4}$ in. broad.

6. **P. confertum,** *Benth. in Trans. Linn. Soc.* xxx. 577; branchlets downy, pinnæ 2, leaflets 4, leaves with glands only at the base of the pinnæ, calyx campanulate, pod unknown.

MALACCA, *Griffith*.

Branchlets of the panicle clothed with brown pubescence. *Leaflets* rigidly coriaceous, shining, strongly veined, oblong, obtusely pointed, 3–4 in. long. *Heads* in copious short axillary and terminal corymbs. *Calyx* $\frac{1}{24}$ in., glabrous. *Corolla* $\frac{1}{8}$ in.; cylindrical tube as long as lanceolate teeth. *Stamens* twice as long as the corolla.

7. **P. bubalinum,** *Benth. in Trans. Linn. Soc.* xxx. 576; branchlets pubescent, pinnæ 2, leaflets 2–4, leaves with glands only at the base of the pinnæ, calyx campanulate, pod large downy not lobed. Inga bubalina, *Jack. in Malay Misc.* ii. 77.

PENANG and MALACCA.

A middle-sized tree. *Branchlets* clothed with pale brown pubescence. *Leaflets* coriaceous, oblong, glabrous, obtusely pointed, 3–4 in. long. *Heads* in ample axillary and terminal corymbose panicles. *Calyx* $\frac{1}{24}$ in., pubescent; teeth deltoid. *Corolla* $\frac{1}{8}$ in., $\frac{1}{3}$–$\frac{1}{4}$ as long as stamens. *Pod* oblong-ligulate, sickle-shaped, 2–3 in. by 1–$1\frac{1}{4}$ in., very rigid, the valves persistently clothed with fine brown down. *Seeds* as large as a bean.

8. **P. microcarpum,** *Benth. in Trans. Linn. Soc.* xxx. 576; branchlets pubescent, pinnæ 2–4, leaflets 4–8, leaves with glands only at the base of the pinnæ, calyx campanulate, pod small glabrous spiral not lobed. Inga bubalina, *Wall. Cat.* 5272, *non Jack.*

PENANG and MALACCA.

Closely allied to *P. bubalinum*, from which it differs by its more numerous and less coriaceous leaflets and especially by its pod, which is $1\frac{1}{2}$ in. by under $\frac{1}{2}$ in., forms a complete spiral, with thinner valves, which become much twisted when it opens, and seeds not larger than a pea.

9. **P. fasciculatum,** *Benth. in Hook. Lond. Journ. Bot.* 1844, 208; branchlets glabrous, glands present on the general petiole and at the base of the pinnæ and upper leaflets, pinnæ 4, leaflets 4–6, calyx campanulate, pod not lobed. Inga Jiringa, *Wall. Cat.* 5268, *non Jack.* I. Clypearia, *Wall. Cat.* 5270 B.

PENANG, SINGAPORE, MALACCA.—DISTRIB. Malay isles.

A tall tree, with terete branchlets and leaf-rachises. *Glands* flat, depressed; general and partial petioles elongated; leaflets obovate-oblong, obtuse or subacute, distinctly stalked, rigidly subcoriaceous, quite glabrous on both sides, the upper 6–8 in. long, the lower shorter and more ovate. *Heads* few-flowered, irregular, sessile or

shortly peduncled, on the elongated glabrous branches of terminal and axillary panicles, with a pair of small spreading lanceolate bracts at the base. *Calyx* $\frac{1}{24}$ in., glabrous. *Corolla* 3 times the length of the calyx. *Pod* firm, glabrous, $1\frac{1}{4}$–$1\frac{1}{2}$ in. broad, at first forming a circle or more, the lower suture not at all waved.

10. **P. lobatum,** *Benth. in Hook. Lond. Journ. Bot.* 1844, 208; branchlets glabrous, glands 0 or confined to general and partial petioles, pinnæ 2, leaflets 4–6, calyx campanulate, pod with the lower suture deeply lobed. Inga lobata, *Grah. in Wall. Cat.* 5280. I. attenuata, *Grah. in Wall. Cat.* 5276. Mimosa Jiringa, *Jack in Hook. Bot. Misc.* i. 282. M. Kæringa, *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 543.

PEGU, TENASSERIM and MALACCA.—DISTRIB. Malay isles, Philippines.

A tall tree, with terete grey glabrous branchlets. *Leaflets* distinctly stalked, acute, oblong or oblong-lanceolate, thin but firm, flexible, glabrous and glossy on both sides, the upper 4–6 in. long. *Heads* few-flowered, with 3–4 small spreading lanceolate bracts at the base, fascicled on short peduncles in ample copious axillary and terminal panicles. *Calyx* sessile, glabrous, $\frac{1}{24}$ in. *Corolla* 3 times calyx, glabrous. *Stamens* $\frac{1}{4}$–$\frac{1}{3}$ in. *Pod* firmer than in its allies, 1–$1\frac{1}{2}$ in. broad, lobed half-way down to the upper suture, into round divisions, which are hemispherical on the face when the seed is ripe.

** *Leaflets numerous, more or less trapezoid through the lower border being cut away at the base.*

11. **P. subcoriaceum,** *Thwaites Enum.* 100; branchlets subterete, pinnæ 6–12, leaflets very small obtuse or subacute, heads not at all or scarcely panicled, calyx subsessile. *Bedd. Fl. Sylv.* 96. P. anamallayanum, *Bedd. Fl. Sylv.* t. 189.

WESTERN PENINSULA; Anamallay hills, 5–8000 ft., *Wight, Beddome.* CEYLON, *Thwaites.*

A tree 30–40 ft. high, with branchlets clothed with dense brown pubescence. *Leaf-rachis* with 1–3 petiolar glands, and one midway between the insertion of each pair of pinnæ; leaflets oblong-trapezoid, $\frac{1}{4}$–$\frac{1}{3}$ in. long, rigidly coriaceous, glossy above, densely pubescent below. *Heads* many-flowered, 1 in. diam., on 1–2-nate axillary peduncles, the uppermost leaves reduced or suppressed. *Calyx* $\frac{1}{12}$ in., brown-downy. *Corolla* funnel-shaped, 3 times the calyx. *Pod* 3–4 in. long, coriaceous, twisted, 5–6 seeded.

12. **P. contortum,** *Mart.*; *Benth. in Hook. Lond. Journ. Bot.* 1844, 210, branchlets subterete, pinnæ 6–12, leaflets 12–30 small obtuse, calyx sessile, heads in ample panicles. Inga contorta, *Grah. in Wall. Cat.* 5283. I. Finlaysoniana, *Grah. in Wall. Cat.* 5284.

PENANG, SINGAPORE, MALACCA.

Branchlets long and slender, densely clothed with dull brown pubescence. *Leaf-rachis* downy, with a small depressed petiolar gland and one below the upper pairs of pinnæ; upper pinnæ 4–6 in. long, lower much shorter, with fewer leaflets; leaflets $\frac{1}{2}$–$\frac{3}{4}$ in. long, obtuse, with the upper and lower edge subparallel, subcoriaceous, shortly pubescent. *Panicles* deltoid, axillary and terminal, with long slender weak finely grey-downy branchlets. *Calyx* $\frac{1}{24}$ in., campanulate. *Corolla* 3–4 times the calyx. *Stamens* twice the corolla. *Pod* $\frac{1}{2}$ ft. by $\frac{1}{2}$–$\frac{3}{4}$ in., at first forming a double spiral, splitting open from the lower suture and very much twisted.

13. **P. Clypearia,** *Benth. in Hook. Lond. Journ.* 1844, 209; branchlets acutely angular, pinnæ 6–12, leaflets 12–24 middle-sized obtuse or acute, calyx stalked, heads in ample panicles. Inga Clypearia, *Jack in Hook. Comp. Bot. Mag.* i. 224; *Wall. Cat.* 5270 A. Mimosa trapezifolia, *Roxb. Fl. Ind.* ii. 546. Inga dimidiata, *Hook. & Arn. Bot. Beech.* 181.

TENASSERIM, PENANG, MALACCA.—DISTRIB. Malay isles, China.

Branches brown-pubescent, with raised lines decurrent from the branchlets. *Leaf-rachises* acutely angled, with a conspicuous raised gland on the petiole, and one between each pair of pinnæ and leaflets; upper pinnæ 5–6 in. long; lower much shorter, with fewer leaflets; upper leaflets 1–2 in. long, with the lower and upper margin nearly parallel, rigidly subcoriaceous, glossy above, densely downy below; lower becoming gradually smaller. *Panicles* axillary and terminal, with densely pubescent erecto-patent sulcate branchlets. *Calyx* campanulate, minute, 3–4 times shorter than the whitish corolla. *Stamens* $\frac{3}{8}$–$\frac{1}{2}$ in. *Pod* like that of *P. contortum*, but rather smaller.

14. **P. montanum,** *Benth. in Hook. Lond. Journ.* 1844, 209; *Pl. Jungh.* 269; branchlets acutely angular, pinnæ 12–18, leaflets 24–32 small acute or subacute, calyx stalked, heads in ample panicles. P. falcifolium, *Hassk, Pl. Jav. Rar.* 418. Inga subfalcata, *Zoll. in Flora,* 1847, 706.

KHASIA, MISHMI.—DISTRIB. Malay isles.

Very near *P. Clypearia*, with which it quite agrees in vestiture, glands, inflorescence, calyx and corolla. *Leaflets* close, regular, $\frac{1}{2}$–$\frac{3}{4}$ in. long, with the midrib as in *P. Clypearia*, carried from the lowest posterior to the upper anterior corner. Lower *pedicels* 2–3 times as long as the calyx. *Branchlets* and leaves below clothed with dense short light brown silky pubescence.

15. **P. angulatum,** *Benth. in Hook. Lond. Journ.* 1844, 208; branches angular, pinnæ 4–6, leaflets 6–12 large acute, calyx stalked, heads in ample panicles. Inga acutangula, *Grah. in Wall. Cat.* 5271. Mimosa heterophylla, *Roxb. Hort. Beng.* 40; *Fl. Ind.* ii. 545.

EAST HIMALAYAS and down the gulf to MALACCA.—DISTRIB. Malay isles.

A tall tree, with stout branchlets with a little fine brown pubescence. *Leaf-rachis* with a large gland at the base and one between each pair of pinnæ and leaflets; lower pinnæ and leaflets much shorter than the upper; leaflets rigidly subcoriaceous, oblong-trapezoid, slightly downy below, the upper 3–4 in. long. *Panicles* copious, ample, axillary and terminal. *Calyx* $\frac{1}{24}$ in., campanulate. *Corolla* white, funnel-shaped, 3–4 times the calyx. *Stamens* $\frac{1}{2}$ in. *Pod* just like those of *P. contortum* and *Clypearia.*

132. INGA, Willd.

Shrubs or trees. *Leaves* simply pinnate. *Flowers* in spikes or globose heads. *Calyx* a minute 3-toothed cup. *Corolla* a cylindrical tube, shortly 3-toothed at the tip. *Stamens* indefinite, much exceeding the corolla, monadelphous more than half-way up the corolla; anthers minute, with the pollen agglomerated in masses. *Ovary* sessile, few-ovuled; style subulate, stigma minute, terminal. *Pod* linear, rigidly coriaceous, with the valves forcibly springing back and each suture expanded into a thick raised border.—DISTRIB. A large American genus (140 species), of which we have a single unsatisfactory representative, with the pod of *Calliandra* and simply pinnate leaf of *Inga.*

1. **I. cynometroides,** *Bedd. MSS.* Calliandra cynometroides, *Bedd. Fl. Sylv.* t. 317; *Benth. in Trans. Linn. Soc.* xxx. 537.

Hills of South TRAVANCORE, 3–4000 ft., *Beddome.*

A middle-sized tree, with slender glabrous branchlets. *Leaflets* 2, sessile at the apex of a very short petiole, rigidly subcoriaceous, venulose, oblique-oblong, subacute, 2–4 in. long. *Flowers* capitate, on short peduncles. *Corolla* $\frac{1}{3}$–$\frac{1}{2}$ in. long. *Pod* sessile, 3–4 in. by $\frac{5}{8}$–$\frac{3}{4}$ in. broad, rather decurved, narrowed to the base, 3–4-seeded, with a short hooked beak, the valves glabrous, flat, margined all round with a thick raised border.

ORDER LI. **ROSACEÆ.** (By J. D. Hooker.)

Herbs, shrubs or trees. *Leaves* stipulate, rarely opposite, simple or compound. *Flowers* usually bisexual and regular (very irregular in *Chrysobalaneæ*). *Calyx-tube* free or adnate to the ovary, limb usually 5-lobed, often bracteolate, imbricate or valvate. *Petals* 5, rarely 0, inserted under the margin of the disk, deciduous, usually imbricate. *Disk* lining the calyx-tube or forming a ring at its base. *Stamens* perigynous, indefinite (rarely 1, 5 or 10) in one or many series, often connate and unilateral in *Chrysobalaneæ*; filaments subulate or filiform, usually incurved in bud; anthers small, didymous. *Ovary* of one or more free or connate carpels, with free or connate styles, which are basal, lateral or subterminal; stigmas simple, penicillate or capitate; ovules 1 or more in each carpel. *Fruit* variable, of achenes, or berries or drupes, rarely capsular. *Seeds* erect or pendulous, testa membranous or coriaceous, albumen 0; cotyledons large, plano-convex; radicle short.—DISTRIB. About 1,000 species, found in all climates and countries, but chiefly in the temperate.

CHRYSOBALANUS ICACO, *Linn.*; the Cocoa-plum of the West Indies is cultivated in some parts of the Malabar Coast, but not frequently.

A. Carpels free or adnate to the side of the calyx-tube.

TRIBE I. **Chrysobalaneæ.** *Flowers* usually irregular. *Carpel* 1; style basal; ovules 2, ascending. *Fruit* a drupe. *Radicle* inferior.—Trees or shrubs with simple quite entire leaves.

Calyx-tube elongate. Stamens many, unilateral. Ovary 2-locellate . . . . 1. PARINARIUM.
Calyx-tube short. Stamens 2. Ovary 1-celled . . . . 2. PARASTEMON.

TRIBE II. **Pruneæ.** *Flowers* regular. *Carpel* 1, rarely 2; style subterminal, rarely basal; ovules 2, pendulous. *Radicle* superior.—Trees or shrubs with simple usually serrated leaves.

Calyx 5-lobed. Petals 5, large, glabrous. Carpel solitary . 3. PRUNUS.
Calyx 5–10-toothed. Petals 5–8, minute or 0. Carpels 1 or 2. Drupe erect, fleshy, with a bony stone . . . . 4. MADDENIA.
Calyx 5-10-toothed. Petals 5, minute or 0. Carpel 1. Drupe erect, coriaceous . . . . 5. PYGEUM.
Calyx 5-lobed. Petals 5. Carpel 1. Drupe inverted, *style sub-basilar* . . . . 6. PRINSEPIA.

TRIBE III. **Spiræeæ.** *Flowers* regular. *Calyx* ebracteolate. *Stamens* 10 or more. *Carpels* 1–8; styles ventral or basal; ovules 2 or more, pendulous. *Radicle* superior.—Shrubs, rarely herbs, with entire or serrate simple or compound leaves.

7. SPIRÆA.

TRIBE IV. **Rubeæ.** *Flowers* regular. *Calyx* ebracteolate. *Stamens* very numerous. *Carpels* many; styles sub-basal or ventral; ovules 2, collateral, pendulous. *Fruit* of many dry or fleshy carpels not included in the calyx-tube. *Radicle* superior.—Usually shrubs, with often compound leaves.

8. RUBUS.

TRIBE V. **Potentilleæ.** *Flowers* regular. *Calyx* usually bracteolate. *Stamens* usually numerous, rarely few. *Carpels* 1 or more; style short or much prolonged after flowering; ovule solitary, ascending. *Fruit* of many achenes, not included in the calyx-tube. *Radicle* superior.—Herbs or small shrubs with various leaves.

Calyx bracteolate. Stamens many. Styles elongated after flowering . . . . 9. GEUM.
Calyx bracteolate. Stamens many. Styles not elongating. Ripe carpels seated on a fleshy receptacle . . . . 10. FRAGARIA.
Calyx bracteolate. Stamens 4 or more. Styles not elongating. Ripe carpels seated on an elevated dry receptacle . . 11. POTENTILLA.
Calyx ebracteolate. Stamens 5. Styles not elongating. Ripe carpels seated on the base of the calyx . . . . 12. CHAMÆRHODOS.

B. Carpels adnate to the tube of the calyx, or, if free, included wholly within it.

TRIBE VI. **Poterieæ.** *Flowers* regular, sometimes apetalous. *Calyx-tube* often urceolate. *Stamens* 1 or more. *Carpels* 1–3; style terminal; ovule 1. *Achene* sunk in the calyx-tube.—Herbs or small shrubs.

Calyx 4–6-bracteolate, or 8–10–12-fid. Petals 0. Carpel 1; ovule ascending . . . . 13. ALCHEMILLA.
Calyx 5-lobed or spinous. Petals 5. Carpels 2–3; ovule pendulous . . . . 14. AGRIMONIA.
Calyx 5-lobed, ebracteolate. Petals 5. Carpels 1–3; ovule pendulous . . . . 15. POTERIUM.

TRIBE VII. **Roseæ.** *Flowers* regular. *Calyx-tube* urceolate. *Petals* 5. *Stamens* very numerous. *Carpels* many, free; ovule 1, pendulous. *Achenes* included in the fleshy calyx-tube.—Shrubs, leaves compound.

16. ROSA.

TRIBE VIII. **Neuradeæ.** *Flowers* regular. *Calyx-tube* enlarged after flowering and becoming confluent with the carpels. *Stamens* 10. *Carpels* 5–10, free, or connate into a 5–10-valved fruit; ovule 1, pendulous.—Herbs.

17. NEURADA.

TRIBE IX. *Flowers* regular. *Calyx-tube* (or top of the peduncle) becoming fleshy after flowering and enclosing the carpels. *Stamens* numerous. *Ovules* 2 or more, ascending. *Fruit* a pome, berry, or a drupe, with the 2–5 bony or coriaceous 1–2-seeded stones.—Shrubs or trees.

* *Ovary 5-celled; cells 3- or more -ovuled.*

Cells of ovary many-ovuled . . . . 17.* CYDONIA.
Cells of ovary 3-ovuled . . . . 18. DOCYNIA.

* *Ovary 2-5-celled; cells 2-ovuled.*

Flowers panicled. Ovary 5-celled . . . . . . 19. ERIOBOTRYA.
Flowers corymbose or fascicled.
Ovary 5-celled. Fruit a pome or berry . . . . . 20. PYRUS.
Ovary 2–3-celled. Fruit 2–3-celled, endocarp thin; testa coriaceous . . . . 21. PHOTINIA.
Ovary 2–3-celled. Fruit 2–3-celled, endocarp thin; testa thick reticulately lacunose . . . . 22. POURTHIÆA.
Ovary 5-celled. Drupe with 5 dehiscent stones . . . 23. STRANVÆSIA.
Ovary 2–5-celled. Drupe with 1–5 bony stones. Leaves cut toothed or serrate . . . . 24. CRATÆGUS.
Ovary 2–5-celled. Drupe with 2–5 bony stones. Leaves quite entire 25. COTONEASTER.

. PARINARIUM, Juss.

Trees. *Leaves* simple, alternate, evergreen, quite entire. *Flowers* hermaphrodite, in corymbose racemes, 2-bracteolate, white or pink. *Calyx-tube* oblong campanulate turbinate or funnel-shaped; lobes 5, subequal, imbricate.

Petals 5, sessile or clawed, deciduous. *Stamens* 6–∞, filaments united into an incomplete ring at the base, or connate into an unilateral bundle, all perfect or some without anthers. *Carpels* 1 (rarely 2), adnate to one side of the calyx-tube, 1–2-celled; style basal, filiform; ovules 2 collateral or 1 erect. *Drupe* spherical oblong obovoid or ovoid, with a 1–2-celled 1–2-seeded coriaceous woody or bony stone. *Seeds* erect, testa membranous, cotyledons large fleshy, radicle small inferior.—DISTRIB. About 40 species, natives of the tropics of both worlds.

The Indian species of *Parinarium* are very imperfectly known and are probably referable to several genera distinguishable by their fruit more than by any floral character. Of these, *P. costatum, polyneurum, oblongifolium* and *multiflorum*, may form one genus with a 2-celled 2-seeded drupaceons fruit and short stamens. *P. nitidum* another, with 1-celled hardly drupaceous coriaceous fruit and short stamens; and *P. asperulum* a third, with a globose 1-celled very hard drupe, glabrous, containing a solitary large glabrous seed with a solid ruminated embryo. The seeds of *P. indicum* and *travancoricum* are unknown. *P. Jackianum*, Benth. (*Petrocarya excelsa*, Jack), must, if Jack's account of the drupe being included in the enlarged calyx and having superposed cells be correct, constitute a fourth genus.

SUBGEN. 1. **Grymania,** *Presl, (Gen.)* *Leaves* eglandular or 2-glandular at the base. *Stamens* equalling or shorter than the calyx-lobes, forming an imperfect ring. *Drupe* oblong or obovoid with a very thick 2-celled stone, the cells lined with soft wool.

* *Leaves eglandular at the base, grey or dirty white beneath, with numerous stout veins. Stamens 6–10, singularly inserted.*

1. **P. costatum,** *Blume?*; leaves 2–4 in. elliptic-oblong obtusely acuminate shining above, base acute, nerves 8–10 pair, petiole rather slender. *Miquel Fl. Ind. Bat.* i. part 1, 354. ? P. Sumatranum, *Benth. in Hook. Niger Flora*, 335. *Miquel l. c.* 353. *Kurz, For. Flor. Brit. Burm.* i. 433. Petrocarya sumatrana, *Jack, Mal. Misc.* ii. 67.

Eastern Peninsula, MALACCA, and Government Hill, PENANG, *Maingay.* ? Burma, *Kurz.*—DISTRIB. Sumatra.

A tree 15 feet (in Penang). *Branches* slender; bark pale in the Malacca specimens, dark with minute lenticels in the Penang one; petiole $\frac{1}{4}$–$\frac{1}{3}$ in. *Panicle* effuse, much branched, clothed with soft tomentum; branches slender, bracts oblong-lanceolate. *Flowers* $\frac{1}{5}$ in. long, shortly pedicelled. *Calyx-tube* clothed within with long deflexed hairs; tube longer than the lobes. *Petals* obovate, ciliate, equalling the calyx-lobes. *Carpels* 2; ovaries densely tomentose. *Fruit* (of Penang specimen) $\frac{3}{4}$–1$\frac{1}{2}$ in. long, rounded at the apex, when dry minutely wrinkled and covered with white scurfy spots. *Seeds* not seen.—But for the smaller leaves with more acuminate points, they agree with *P. sumatranum*, Benth. I have seen no specimen of Blume's *P. costatum.*

2. **P. polyneurum,** *Miq. Fl. Ind. Bat. Suppl.* 306; leaves 4–8 in. elliptic-oblong obtusely acuminate shining above, base rounded, nerves 12–16 pair, petiole rather slender.

MALACCA, *Griffith; Maingay* (*Kew Herb.*, 622).—DISTRIB. Sumatra.

A larger plant than *P. costatum*, differing in the form and size of the leaves and number of nerves; the inflorescence and flower are very similar indeed; the bark of the branches is black with numerous lenticels, which is hardly the case in the Sumatran specimens.

3. **P. oblongifolium,** *Hook. f.*; leaves 6–10 in. oblong or linear-oblong

obtuse shining above, base rounded and cordate, nerves 20–30 pair, petiole very stout.

MALACCA, *Griffith, Maingay* (*Herb. Kew*, 623).

This is very near to the two former, differing only in the shape and size of the leaves, their petiole and nervation. I cannot doubt but that one of these three is a form of the *P. sumatranum*, Bth. (PETROCARYA, Jack).

** *Leaves 2-glandular at the base, glabrous and shining on both surfaces. Stamens* 20–30.

4. **P. Griffithianum,** *Benth. in Hook. Niger Fl.* 334; leaves elliptic-lanceolate caudate-acuminate. P. multiflorum, *Miq. Fl. Ind. Bat.* i. part i. 356. Maranthes multiflora, *Korth. Verh. Nat. Gesch. Bot.* 259, t. 70.

Eastern Peninsula. TENASSERIM OR ANDAMAN ISLANDS, *Helfer*; MALACCA, *Griffith, Maingay*.—DISTRIB. Borneo.

Branches stout, with black bark. *Leaves* 5–6 in., narrowed into the short petiole; nerves much arched. *Panicles* shortly peduncled, closely corymbose, with stout branches and pedicels; bracts very deciduous. *Flower* $\frac{1}{3}$ in. diam. *Calyx* hoary; tube obconic, gibbous, glabrous within except near the ovary; lobes orbicular, linear. *Petals* obovate-orbicular, glabrous, equalling the calyx-lobes. *Stamens* 20–30; filaments united above the base into a coriaceous short tube which is open and toothed opposite the ovary. *Ovary* tomentose; style short, curved; stigma capitate. *Drupe* 1–1¼ in. long, cylindric-obovoid or subclavate, hoary, 2-celled; cells stuffed with brown soft wool.—Differs from the Javanese *P. corymbosum* in the hoary calyx; and from the Philippine Island *P. salicifolium*, Benth. (*Grymania*, Presl), in the foliage.

SUBGEN. II. *Leaves* eglandular at the base. *Stamens* shorter than the calyx-lobes, irregularly united into a ring. *Drupe* small, obovoid, with a thin 1-celled endocarp lined with hairs. *Cotyledons* amygdaloid.

5. **P. nitidum,** *Hook. f.*; branches and leaves quite glabrous, leaves elliptic or elliptic-lanceolate obtusely acuminate narrowed into the very short petiole polished on both surfaces.

MALACCA, *Griffith, Maingay* (Herb. Kew 619).—DISTRIB. Borneo.

A small tree (Griffith), branchlets slender. *Leaves* 3–4 in., coriaceous, very acute at the base, polished on both surfaces, especially above; nerves very slender, much arched; petiole $\frac{1}{8}$ in.; stipules subulate, *Panicles* axillary and terminal, hoary, narrow, with rather short spreading branches. *Flowers* small, $\frac{1}{10}$ in., very shortly pedicelled. *Calyx-tube* obconic, pubescent within; lobes short and rounded. *Petals* very small, obovate, tomentose. *Stamens* 5–7, filaments united into a short ring that is toothed opposite the ovary. *Carpel* (1-celled, *Griff.*) inserted almost at the base of the calyx-tube, villous. *Drupe* obovoid, $\frac{1}{3}$–$\frac{1}{2}$ in. long, yellow, smooth, glabrous.

SUBGEN. III. *Leaves* eglandular or 2-glandular at the base. *Stamens* longer than the calyx-lobes, unilateral. *Drupe* large, globose, woody, glabrous within; unknown in *P. indicum* and *travancoricum*.

* *Leaves eglandular at the base.*

6. **P. asperulum,** *Miq. Fl. Ind. Bat. Suppl.* 307; branches and leaves quite glabrous, leaves elliptic-oblong obtuse or obtusely acuminate, flowers in short stout tomentose thyrsoid spikes.

MALACCA, *Griffith. Maingay* (Herb. Kew, 618).—DISTRIB. Sumatra.

Branches black, slender, and leaves glabrous. *Leaves* 3–4 in., suddenly contracted to the obtuse point, shining above and covered sometimes with minute raised points, base rounded; nerves about 10 pair, very slender with intermediate reticulations; petiole very short. *Spikes* 2–4 in. long, the very stout angular peduncle

and rachis densely clothed with soft yellowish tomentum; bracts oblong, obtuse. *Flowers* sessile, $\frac{1}{3}$ in. long. *Calyx-tube* clavate, gibbous, clothed with silky hairs outside, and with long deflexed hairs inside; lobes broadly ovate, obtuse. *Petals* obovate, sessile, nearly glabrous. *Stamens* 12–15, $\frac{1}{3}$ in. long, circinnately incurved, united at the base into a unilateral ring which is deficient opposite the single carpel. *Ovary* densely woolly, imperfectly 2-celled; style very long and slender, stigma minute. *Drupe* the size of a small apple, spherical, very hard; outer surface rough and rust-coloured; endocarp $\frac{1}{6}$ in. thick, bony; cavity smooth with a furrow down one side and a few very stout sparingly branched raised veins. *Seed* large, testa thin; embryo with the cotyledons consolidated into a ruminated mass.

** *Leaves obscurely 2-glandular at the base.*

7. **P. indicum,** *Bedd. Ic. Pl. Ind. Or.* t. 109; *Flor. Sylvat.* t. 191; leaves elliptic-lanceolate, glabrous, nerves 8–10 pair, racemes tomentose. Entosiphon, *Bedd. in Mad. Journ. Litt. Ser.* 3. i. 44.

WESTERN PENINSULA; Wynad, in moist woods, alt. 2–3000 ft., *Beddome.*

A middling sized tree. *Leaves* 8–9 by 3 in., slightly undulate; nerves strong beneath, much arched; petiole very short. *Racemes* axillary and terminal, simple, stout, rarely divided at the base. *Flowers* shortly pedicelled, $\frac{1}{2}$–$\frac{2}{3}$ in. long. *Calyx-tube* campanulate; lobes ovate, acute. *Petals* ovate, sessile, shorter than the calyx-lobes. *Stamens* 12–15, unilateral, twice as long as the calyx-lobes. *Ovary* hairy, 2-celled.

8. **P. travancoricum,** *Bedd. Ic. Pl. Ind. Or.* t. 189; leaves lanceolate glabrous, nerves 12–16 pair, racemes silky.

WESTERN PENINSULA, near Courtallum, alt. 2000 ft., *Beddome.*

A small graceful tree, young parts grey, silky; branchlets very slender. *Leaves* 4–5 by 1–1$\frac{1}{4}$ in., obtusely acuminate; margins waved; nerves beneath silky when young, finally glabrous; petiole very short. *Racemes* 1–2 in., few-flowered, simple or branched at the base, drooping, silky. *Flowers* $\frac{1}{4}$ in. long. *Calyx-tube* campanulate; lobes ovate, acute. *Petals* broadly ovate, obtuse, equalling or exceeding the calyx-lobes. *Stamens* 10–12, unilateral, filaments three times as long as the calyx-lobes. *Ovary* hairy, 2-celled.

DOUBTFUL, EXCLUDED AND IMPERFECTLY KNOWN SPECIES.

P. WALLICHIANUM, *Wall. Cat.* 7520; consists of branches with leaves only of a most conspicuous plant from Sincapore, which I suspect is a *Dipterocarpus.* Branchlets very stout and leaves beneath clothed most densely with appressed snow-white almost silvery tomentum; leaves 8–14 by 3–6 in., oblong, abruptly acuminate, rounded at the base, quite entire; nerves 30–35 pair, spreading; upper surface shining; petiole very short and stout; stipules sheathing, 1 in. long, membranous.—Sincapore. A lofty tree (*Wallich*).

P. HELFERI, *Hook. f.*; branchlets slender clothed with soft rusty tomentum. leaves elliptic-oblong acuminate membranous white and downy beneath, nerves about 12 pair, flowers minute in small softly tomentose panicles, calyx-tube shortly campanulate, stamens 6–7. P. sumatranum, *Kurz, For. Flor. Brit. Burm.* i. 433, *not of Benth.?*

TENASSERIM, *Helfer.*

Leaves 3–4 in., base rounded or acute; petiole and midrib beneath when young clothed with rusty soft wool; whole undersurface clothed with loose snow-white tomentum when young, hoary when old; nerves spreading, slender. *Panicle* 1 in. long. *Flowers* $\frac{1}{10}$ in., very shortly pedicelled. *Calyx-lobes* short, rounded. *Petals* very small, ovate. *Stamens* equalling the calyx-lobes.—I have seen but one specimen.

P.? A species, apparently allied to *P. Helferi,* collected by Griffith on hills

at Palor in Mergui; it has broadly linear-oblong leaves 5–7 in., quite glabrous and shining above with 8–10 pairs of very oblique nerves, undersurface also glabrous except the puberulous midrib and nerves; petiole stout, tomentose. *Flowers* minute, in very small axillary racemes, densely tomentose, too young to discern their parts.

P.? JACKIANUM, *Benth. in Hook. Niger Flor.* 335 (Petrocarya excelsa, *Jack, in Mal. Misc.* ii. 66.); 'a large tree, leaves oblong acuminate glabrous, racemes ferruginous and tomentose strict erect sparingly branched, stamens 11 unilateral twice as long as the petals, drupe enclosed in the enlarged calyx and adnate to it, nuts smooth 1-celled, with an abortive cell usually above the fertile, embryo cylindric.'—Malaya, *Jack.* But for the description of the fruit, this might be *P. asperulum*, Miq.

PARINARIUM DILLENIFOLIUM, *R. Br. in Wall. Cat.* 7520 (Petrocarya dillenifolia, Steud.), is *Dipterocarpus cornutus*, Dyer.

P. EXCELSUM, *G. Don, Gen. Syst. Gard.* ii. 479; *Dalz. & Gibs. Bomb. Flor. Suppl.* 32. A tree introduced at Goa from Mozambique, and called Matomba by the Portuguese, is imperfectly known and should be ascertained.

2. **PARASTEMON,** *A. D.C.*

A shrub or small tree. *Leaves* simple, alternate, evergreen, quite entire. *Flowers* polygamo-diœcious, minute, racemose, ebracteolate. *Calyx-tube* shortly campanulate; lobes 5, imbricate. *Petals* 5 (or 6), oblong, deciduous. *Stamens* 2 perfect, unilateral. *Carpel* 1, adnate to one side of the calyx-tube, 1-celled; style basilar; ovules 2, erect. *Fruit* oblong, coriaceous, 1-celled, 1-seeded, indehiscent. *Seed* erect, testa membranous pubescent; cotyledons fleshy, radicle inferior, plumule hairy.

1. **P. urophyllum,** *A. D.C. in Ann. Sc. Nat. Ser.* 2. xviii. 208. Embelia urophylla, *Wall. Cat.* 2309. Celastrus racemosa, *Wall. Cat.* 4320.

Eastern Peninsula; SINCAPORE, *Wallich*; MALACCA, *Griffith*, *Maingay*; TENASSERIM OR ANDAMAN ISLANDS, *Helfer*.—DISTRIB. Borneo.

Quite glabrous. *Leaves* 2–3 in., elliptic or elliptic-lanceolate, obtusely acuminate, shining, narrowed at the base into the very short petiole; nerves faint. *Racemes* slender, axillary, equalling the leaves, rarely branched at the base; bracts concave, at the base of the pedicel. *Flowers* $\frac{1}{18}$ in. diam., shortly pedicelled. *Fruit* $\frac{1}{2}$ in. long, ellipsoid, quite smooth and glabrous.

3. **PRUNUS,** *Linn.*

Shrubs or trees. *Leaves* alternate, simple, quite entire or serrate or crenate or glandular-serrulate; petiole often 2-glandular. *Flowers* white or red, solitary fascicled corymbose or racemed. *Calyx* deciduous in fruit; lobes 5, imbricate. *Petals* 5. *Stamens* 15–60, perigynous, inserted in the mouth of the calyx-tube, filaments free. *Carpel* 1; style terminal; ovules 2, collateral, pendulous. *Drupe* with an indehiscent or 2-valved, 1-seeded, smooth, or rugged stone. *Seed* pendulous, testa membranous or coriaceous, albumen scanty or 0.—DISTRIB. N. temp. regions, rare in the tropics; species 80.

The scented kernels of the European and West Asiatic *P. Mahaleb*, L., are sold in the bazaars of N.W. India, and the tree is cultivated in Beluchistan, and probably occurs on the N.W. frontier; it is a small tree of the *Cerasus* section, with ovate crenate leaves, fragrant flowers in peduncled corymbose racemes, and ovoid drupes $\frac{1}{4}$ in. long.

SECT. I. **Amygdalus.** *Leaves* conduplicate in bud. *Flowers* subsessile. *Drupe* usually pubescent; stone bony, rugged.

P. AMYGDALUS, *Baill.*; leaves appearing after the flowers oblong-lanceolate serrulate, petiole glandular as long as the leaf is broad or longer, stipules fimbriate, flowers peduncled, calyx campanulate, pericarp 2-valved. *Brandis For. Flor.* 190. Amygdalus communis, *Linn.; Roxb. Fl. Ind.* ii. 500.—The almond.

Cultivated in the cooler parts of India.

P. PERSICA, *Benth. & Hook. f. Gen. Plant.* i. 609; leaves appearing after or with the flowers oblong-lanceolate serrate, petiole glandular or not shorter than the leaf is broad, stipules fimbriate, flowers sessile, calyx campanulate, pericarp indehiscent. *Brandis For. Flor.* 191. Amygdalus persica, *Linn.; Roxb. Fl. Ind.* ii. 500. A. collinus, *Wall. Cat.* 723. Persica vulgaris, *Miller.* ? P. saligna, *Royle Ill.* 204 (name only).—The peach. *Wall. Cat.* 7120.

Cultivated in the cooler parts of India: up to 10,000 ft. in the N.W. Himalaya. The nectarine is a form with glabrous and the peach with downy pericarp.

SECT. II. **Armeniaca.** *Leaves* convolute in bud. *Flowers* sessile or peduncled. *Drupe* large, indehiscent, downy; stone bony, smooth.

P. ARMENIACA, Linn.; leaves appearing after or with the flowers broadly ovate acuminate crenate, petiole glandular, stipules lanceolate, flowers shortly peduncled, calyx campanulate, stone with a thickened grooved margin. *Roxb. Fl. Ind.* ii. 501. *Brand. For. Flor.* 191.—The apricot.

Cultivated and almost naturalised in N.W. India up to 10,000 ft., and in Tibet.

VAR. *dasycarpa*, the black-fruited apricot, is also cultivated in Kashmir. *Brandis l. c.* Thomson's Kashmir specimens (cultivated at 5–7,000 ft.) have peduncles longer than the calyx-tube.

SECT. III. **Cerasus.** *Leaves* conduplicate in bud. *Flowers* solitary fascicled or umbelled. *Calyx-tube* short or long. *Drupe* glabrous, not glaucous.

* *Flowers appearing with the leaves.*

P. AVIUM, *Linn.*; roots without suckers, leaves flaccid drooping oblong-obovate acutely serrate pubescent beneath, petiole long 2-glandular, flower fascicled long-pedicelled, flowering buds leafless, calyx-tube urceolate constricted at the top, lobes entire, petals flaccid spreading almost obcordate, fruit sweet or bitter, stone smooth. P. Cerasus α, *Brandis For. Flor.* 193.—Sweet cherry or gean.

Cultivated in the N. W. Himalaya up to 8000 ft., and almost naturalised.

P. CERASUS, *Linn.*; roots with many suckers, leaves erect firm shining crenate-serrate glabrous beneath, petiole short eglandular, flowers fascicled long-pedicelled, flowering buds leafy, calyx-tube campanulate not constricted at the top, lobes crenate, petals erect stiff tip rounded, fruit acid, stone smooth. *Roxb. Fl. Ind.* ii. 501. P. caproniana, *DC. Prodr.* ii. 536.—Wild cherry.

Cultivated in the N. W. Himalaya up to 8000 ft.

1. **P. prostrata,** *Labill.*; *Boiss. Flor. Orient.* ii. 648; leaves small elliptic- or ovate-oblong obtuse serrate glabrous above white and tomentose beneath, flowers solitary or fascicled subsessile, calyx-tube cylindric, fruit small almost dry. *Brandis For. Flor.* 193; *Sibth. Flor. Græc.* t. 478. *Bot. Reg.* t. 136.

WESTERN TEMPERATE HIMALAYA from the Sutlej westwards, alt. 5–10,000 ft., *Jacquemont, Falconer*, etc.—DISTRIB. Westward to Spain, ascending to 12,000 ft. in Afghanistan.

A scraggy shrub 5–6 ft.; branches hoary, spreading, suberect or prostrate. *Leaves* ½–1 in., usually snowy white beneath, rarely green, narrowed into the short eglandular petiole. *Flowers* red, on lateral buds, appearing with the leaves. *Calyx-tube* ¼ in., cylindric, glabrous or pubescent; limb with 5 oblong obtuse entire lobes. *Petals* orbicular-obovate, longer than the calyx, rosy. *Stamens* much shorter. *Fruit* ⅓ in., ovoid or subglobose, red-purple, flesh scarcely eatable.

2. **P. tomentosa,** *Thunb. Fl. Jap.* 203; branchlets tomentose, leaves shortly petioled orbicular-ovate acuminate crenate-serrate sparingly hairy above densely and softly so beneath, flowers solitary pedicelled, calyx-tube shortly cylindric glabrous. P. trichocarpa, *Bunge, En. Plant. Chin. Bor.* 96; *Sieb. & Zucc. Fl. Japon.* t. 22; Cerasus tomentosa, *Wall. Cat.* 715.

North West Himalaya; KASHMIR, alt. 5–6000 ft. *Thomson.* WESTERN TIBET, Ladak, *Moorcroft.*—DISTRIB. N. China.

A shrub, with slender spreading branches. *Leaves* 1–1½ in., membranous, almost velvety beneath, base rounded, tip sometimes prolonged; petiole very short, eglandular, tomentose; stipules slender, laciniate. *Flowers* axillary. *Calyx-tube* ¼ in.; lobes oblong-lanceolate, acute, entire. *Petals* small. *Fruit* ellipsoid, young hairy pointed, ripe obtuse compressed.

5893 3. **P. rufa,** *Wall. Cat.* 721 (Cerasus); young branches densely tomentose, leaves elliptic- or oblong-lanceolate caudate-acuminate serrate glabrate, petiole eglandular pubescent, flowers axillary solitary or fascicled, calyx-tube urceolate glabrous. P. ferruginea, *Wall. MSS.*

Central and Eastern temperate Himalaya, NEPAL, *Wallich*: SIKKIM, alt. 10–12,000 ft. J. D. H. BHOTAN, Griffith.

A small tree, 15–20 ft., branchlets woody. *Leaves* 1–4 in., narrowed into the short petiole, very sharply serrate, midrib puberulous above pubescent or glabrate beneath; nerves reticulated; petiole ½ in.; bud-scales linear, membranous, glandular-serrate; stipules filiform laciniate. *Flowers* pink; peduncles glabrous, longer than the petioles. *Calyx-tube* ⅓ in., ventricose at the base, then contracted, mouth spreading, lobes broad short subacute crenulate. *Petals* small, orbicular. *Fruit* ellipsoid, on stout lengthened pedicels, red, fleshy, stone rugged.

** *Flowers appearing before the leaves.*

4. **P. Jacquemontii,** *Hook. f.*; dwarf, leaves small elliptic or obovate acute sharply serrate glabrous or minutely puberulous beneath, petiole eglandular, stipules setaceous, drupe globose, stone smooth. Amygdalus humilis, *Edgw. in Trans. Linn. Soc.* xx. 44, *not of Bunge.*

Western Himalaya; in the TIBETAN region, *Jacquemont.* GURWHAL, Malari, alt. 9000 ft., *Edgworth*; Niti, 11,500 ft., *Strachy and Winterbottom.* KUNAWUR, alt. 12,000 ft., *T. Thomson.*

Branches strict, slender, divaricating, glabrous, or puberulous in the leaf axils and buds. *Leaves* 1 in., variable in breadth, from linear-oblong to rhomboid-obovate but usually elliptic, narrowed into the short petiole, rather coriaceous; nerves nearly straight, very oblique; petiole puberulous. (*Calyx-tube* glabrous except at the base within; lobes short, crenulate. *Petals* short, obovate. *Ovary* glabrous, *Edgw.*) *Drupe* very shortly pedicelled, fleshy in Jacquemont's specimen, dry globose and cuspidate in Thomson's, stone smooth.

I refer this doubtfully to the section with the flowers appearing before the leaves; the specimens being in fruit only. This is the species mentioned by Brandis (For. Flor. 194, under *P. Puddum*) as *P. humilis*, Bunge, of China, and found from the Chenab to the Jumna, but it differs much from Bunge's *humilis* in the very short peduncles, and much coarser serratures of the leaves. Edgworth gave it the name of *Amygdalus humilis*, without reference to Bunge's species of *Prunus* of that name.

5. **P. Puddum,** *Roxb. MSS. in Herb. Wall.*; arboreous, leaves ovate- or oblong-lanceolate caudate-acuminate sharply serrate, petiole 2–4-glandular, flowers solitary fascicled or umbelled, calyx-tube narrowly campanulate, petals obovate or linear-oblong. *Brande's For. Flor.* 194; *Kurz, For. Flor. Brit. Burm.*, i. 434. P. cerasoides, *Don, Prodr.* 239. P. sylvatica, *Roxb. Fl. Ind.* ii. 501. Cerasus Puddum, *Wall. Pl. As. Rar.* ii. 37, t. 143; *Cat.* 714. C. Phoshia, *Ham. in Don, Prodr.* 239.

Temperate Himalaya; from GURWHAL, alt. 3–6000 ft. to SIKKIM and BHOTAN, alt. 5–8000 ft. BURMA, East of Bhamo, *Kurz.*

A large tree, of brilliant appearance in flower, glabrous except the puberulous young shoots. *Leaves* 3–5 in., variable in length and breadth, often doubly serrate, glabrous; petiole slender, ½–⅔ in.; stipules long, subulate, laciniate. *Flowers* rose red or white, from lateral buds clothed with concave rounded glabrous scales; peduncles ½–1 in., often subcymose, connate at the base or almost umbellate. *Calyx-tube* ⅓ in., glabrous; lobes ovate, acute, quite entire. *Drupe* oblong or ellipsoid, obtuse at both ends; flesh scanty yellow or reddish, acid; stone bony rugose and furrowed. —Allied to the *C. pseudocerasus,* of Japan. In Sikkim the ovary is often (from insect puncture) enlarged into a fusiform pale smooth fleshy body 2 inches long gradually narrowed into the elongate filiform style.

SECT. IV. **Prunus proper.** *Leaves* convolute in bud, appearing after the flowers. *Flowers* solitary or fascicled. *Calyx-tube* short. *Drupe* glabrous, usually glaucous.

6. **P. communis,** *Huds.*; var. INSITITIA; shrubby, unarmed or spinous, leaves obovate ovate or ovate-lanceolate serrulate obtuse acute or cuspidate, nerves hairy beneath, peduncles solitary or in pairs, calyx-tube obconic, drupe globose or ovoid drooping. *Brand. For. Flor.* 192. P. insititia, *Linn.*; P. bokhariensis, and P. aloocha, *Royle Ill.* 205 (*names only*),

Western temperate Himalaya; cultivated or indigenous from GURWHAL to KASHMIR, alt. 5–7000 ft. ('truly wild,' *T. Thomson*).

This, Thomson who gathered it in Kashmir, considers to be the common yellow fruited bullace; its fruit is eatable, and I see no character whereby to distinguish it from that plant. I have seen no specimens of Royle's *P. aloocha* and *bokhariensis,* but have no reason to doubt that they are referable to this. A dark blue damson, probably *P. communis,* var. *domestica,* and an orange red larger one, are stated by Madden (As. Soc. Journ. xvii. part i. 445), to be cultivated about Almorah.

7. **P. triflora,** *Roxb. Hort. Beng.* 38; *Fl. Ind.* ii. 501 (*trifolia*); shrubby, unarmed, leaves oblanceolate crenulate shortly acuminate nerves glabrous beneath, peduncles usually in threes, calyx-tube turbinate, drupes ovoid cordiform. *Kurz, For. Flor. Brit. Burm.* i. 434; *Wall. Cat.* 720.

AVA HILLS, *Kurz.*—DISTRIB. China.

A bushy tree, with blackish bark, everywhere glabrous. *Leaves* 2–4 in., recurved, eglandular at the base, equitant in bud; petiole slender; stipules gland-ciliate. *Flowers* small, white, very regularly in threes from the buds; peduncle ½ in. *Calyx-lobes* longer than the tube, ovate, acute, margins glandular. *Petals* ⅓ in., broadly obovate. *Ovary* ovoid, stigma large. *Drupe* purple, glaucous, grooved on one side; pulp reddish yellow.—I have taken the characters from Roxburgh and Kurz.

SECT. V. **Laurocerasus.** *Leaves* conduplicate in bud. *Flowers* in axillary or terminal many-flowered racemes. *Calyx-tube* short, obconic. *Drupe* glaucous or not.

* *Leaves deciduous.*

8. **P. Padus,** *Linn*; leaves oblong-obovate or -lanceolate acuminate, sharply closely serrulate, base rounded or cordate, nerves 10–20 pair, petiole often eglandular, racemes elongate pendulous, flowers ¼–⅓ in. diam., stamens 30–40, drupe ⅓ in. diam. globose, stone rugose. *Brandis For. Flor.* 194. Cerasus cornuta, *Wall. Cat.* 716 and 717 *in part*; *Royle Ill.* 207, t. 38, f. 2.

Temperate Himalaya, from MURREE, alt. 6–9500, to SIKKIM, alt. 8–12,000 ft., and BHOTAN.—DISTRIB. Westward to Great Britain, and Siberia to Kamtschatka.

A small nearly glabrous tree, with young parts sparingly pubescent. *Leaves* very variable, 4–6 in., usually oblong-lanceolate with a cordate base, serratures often double very close-set; nerves often with hairs in the axils beneath, under-surface not glaucous; nerves spreading, slightly arched; petiole ½–1 in., slender, glands small or 0; stipules linear, membranous, caducous. *Racemes* from the axils of fallen leaves or terminating lateral leaf-branchlets, 4–10 in. long, drooping; peduncle and rachis glabrous pubescent or tomentose; pedicels ¼ in.; bracts linear, caducous. *Flowers* white. *Calyx-tube* hemispheric or turbinate; lobes rounded, obtuse, gland-toothed. *Petals* orbicular, concave. *Drupe* acid, the size of a large pea; stone thick, rugged.—Wallich's name of *cornuta* alludes to a diseased (by insects) condition of the ovary, which becomes elongate curved and fusiform as in *P. Puddum.* Foliage red in autumn.

9. **P. nepalensis,** *Ser. in DC. Prodr.* ii. 540 (Cerasus); leaves lanceolate or oblong-lanceolate acuminate crenate-serrate glaucous beneath, nerves 16–20 pairs, base usually acute, petiole eglandular, racemes elongate, drupe globose, stone smooth ⅔ in. diam. Cerasus glaucifolia, *Wall. Cat.* 717. C. Lindleyana, *Wall. Cat.* 1008.

Temperate Himalaya, from KURMAON, alt. 6000 ft. to SIKKIM alt. 7–10,000 ft. KHASIA MTS., alt. 4–6000 ft.

Very difficult to distinguish from *P. Padus* except by the fruit, which is more than twice as large, with a quite smooth thick-walled stone; leaves usually glaucous beneath and acute at the base, serratures far less sharp and more distant; calyx lobes shorter.

10. **P. undulata,** *Ham. in Don Prodr.* 239; leaves membranous oblong-lanceolate acuminate crenate-serrate glabrous, nerves 6–10 pair, petiole usually eglandular, racemes slender, flowers ⅙ in. diam., stamens 15–20, drupe globose pointed, stone smooth ¼ in. P. adenophylla, *Wall. MSS.* Cerasus undulata, *Ser. MSS. in DC. Prodr.* ii. 540. C. capricida, *Wall. Cat.* 718.

Temperate Himalaya from KUMAON alt. 6–8000 ft. to SIKKIM alt. 8–12,000 ft., and BHOTAN. KHASIA MTS., *Griffith.*

Branches slender, quite glabrous. *Leaves* variable, usually 2–3 in., oblong-lanceolate but often larger and almost linear-lanceolate, base acute or rounded, membranous and undulate when dry; nerves 8–10 pair, slender, spreading and arched; glands 0 or 1 or 2 at the base of the leaf, rarely on the slender petioles. *Racemes* usually more slender than in the two preceding species, glabrous or puberulous. *Flowers* white. *Calyx-tube* glabrous, lobes glabrous or ciliate. *Stamens* short. *Drupe* with a thin-walled smooth stone.—Foliage of this is often like that of *P. nepalensis,* but has usually fewer veins, and the small flowers and drupes well distinguish it—Wallich observes that the foliage is poisonous to goats.

** *Foliage persistent.*

11. **P. martabanica,** *Wall. Cat.* 4902 (Cerasus ?); glabrous except the pubescent racemes, leaves oblong-lanceolate caudate-acuminate quite entire smooth, nerves very faint, racemes fascicled stout short, petals small orbicular, stamens very numerous. *Kurz, For. Flor. Brit. Burm.* i. 434.

Eastern Peninsula; MARTABAN, *Wallich*; MERGUI, *Griffith*; ANDAMAN and TENASSERIM, *Kurz.*

Branchlets quite glabrous. *Leaves* 5–7 in. long, coriaceous, very smooth on both surfaces, shining above, base rounded; nerves 6–8 pair, arched, very slender; petiole ⅔–½ in., slender, eglandular. *Racemes* 1–7 in., usually on the old wood; peduncle and rachis strict; pedicels ⅙ in., stout. *Flowers* ¼ in. diam. *Calyx-tube* obconic, coriaceous; lobes erect, ovate, obtuse. *Petals* small, orbicular. *Stamens* 60–80 in many series. *Ovary* glabrous, style long, exserted; Drupe 1¼ in. long, cylindric oblong, pointed, apparently dry; stone thin-walled, smooth.—Foliage like that of *P. javanica*

nica, Miq., but calyx very different and drupe larger. Kurz however refers to this both *P. javanica* and *Junghuhniana* of Miquel (Journ. As. Soc. Beng. 1871, ii. 52, and Andaman Reports, ed. ii. 37).

12. **P. acuminata,** *Wall. Pl. As. Rar.* ii. 78, t. 181 (Cerasus); glabrous throughout, leaves lanceolate caudate-acuminate quite entire or remotely serrate, racemes axillary solitary or fascicled very slender, petals oblong, stamens about 15. *Wall. Cat.* 719. C. integerrima, *Wall. Cat.* 722.

Temperate Central and Eastern Himalaya, from NEPAL and SIKKIM, alt. 5–7000 ft., to MISHMI. KHASIA MTS. alt. 4000 ft.

A tree 30–40 ft.; branches slender. *Leaves* 4–7 in., flat, smooth on both surfaces, hardly shining above, base rounded or acute, sometimes dotted beneath with minute glands, or glands 0 or few and scattered; nerves 8–10 pair, obliquely ascending, slender but evident; petiole $\frac{1}{4}$ in., eglandular; stipules linear. *Racemes* 3–5 in., suberect or drooping, many-flowered; pedicels $\frac{1}{6}$ in., slender; bracts minute. *Flowers* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., yellowish-white. *Calyx-tube* broadly campanulate; limb patent, obscurely 5-toothed. *Ovary* villous. *Drupe* ovoid, subacute, $\frac{1}{2}$ in. long; stone thin, quite smooth.

5473 13. **P. punctata,** *Hook. f. & T. in Herb. Ind. Or.* (*Cerasus*); quite glabrous, leaves oblong-lanceolate caudate-acuminate quite entire or serrulate dotted with minute glands beneath, racemes subcorymbiform, stamens about 30.

KHASIA MTS., alt. 4–5000 ft., *Jenkins*, etc.

A shrub or small tree with slender pendulous branchlets, the youngest puberulous. *Leaves* 3–5 in., caudate points curved very long obtuse, base acute, smooth on both surfaces, shining above; nerves 8–10 pairs, slender, obliquely arched; petiole $\frac{1}{4}$ in., eglandular; stipules filiform. *Racemes* axillary, solitary, shorter than the leaves, 8–10-flowered; peduncle very slender; pedicels $\frac{1}{4}$–$\frac{1}{3}$ in., subcorymbose towards the top of the peduncle. *Flowers* $\frac{1}{4}$ in. diam. *Calyx-tube* obconic; lobes 5. rounded, ciliate. *Petals* orbicular, ciliate. *Ovary* glabrous. *Drupe* globose; stone thin-walled, quite smooth.

5497 14. **P. Jenkinsii,** *Hook. f. & Thoms. in Herb. Ind Or.* (*Cerasus*); leaves linear-oblong caudate-acuminate serrate undulate shining eglandular, racemes axillary short cylindric dense-flowered pubescent, stamens about 50.

ASSAM, *Jenkins*; at Choorpura, (Upper Assam), *Griffith*.

Branches black, stout, glabrous. *Leaves* 5–7 in., tip obtuse, base acute, red-brown above when dry, paler beneath, margin undulate, teeth when present remote; nerves 10–15 pair, obliquely arching; petiole $\frac{1}{2}$ in., eglandular; stipules linear-lanceolate. *Racemes* $1\frac{1}{2}$–$2\frac{1}{2}$ in., strict, erect, usually densely clothed with flowers to the base which is enclosed in concave orbicular scales; pedicels very smooth. *Calyx-tube* turbinate; lobes rounded, ciliate. *Petals* small, orbicular, erose. *Ovary* glabrous. *Drupe* with the stone $\frac{2}{3}$ in., broadly ovoid, obtuse, rugose, and with a thick ridge on one side, walls very thick and hard.

4. MADDENIA, *Hook. f. & Thoms.*

Deciduous leaved trees. *Leaves* alternate, glandular-fringed or -serrate; stipules conspicuous, gland-serrate. *Flowers* in racemes or corymbs, sub-unisexual. *Calyx-tube* turbinate, 10-lobed, some of the lobes often produced into oblong tomentose petals. *Stamens* 20–30, in one series, filaments incurved; anthers small. *Carpels* 1, with a slender style and usually not perfecting, or two with shorter or no styles and larger stigmas, one or both perfecting; ovules 2, collateral, pendulous. *Fruit* an oblong drupe; pericarp thin; stone rather bony. *Cotyledons* thick, oblong. DISTRIB. Two Indian species.

A form between *Pygeum* and *Prunus*, differing from both in the frequent twin

carpels, of which both often ripen, from *Pygeum* in the form of the fruit habit, and deciduous foliage, and from *Prunus* in the flower which is altogether that of *Pygeum* except for the carpels.

1. **M. himalaica,** *Hook. f. & Thoms. in Hook. Kew Journ. Bot.* vi. 1854) 380, t. xii.; racemes tomentose short dense-flowered.

Temperate Eastern Himalaya; SIKKIM, Lachen River, alt. 8–1000 ft. BHOTAN, *Griffith.*

A small tree, 20–30 ft.; bark of branches red brown, shining. *Leaves* 3–5 in., variable in shape, ovate or obovate-lanceolate caudate-acuminate, rather membranous, densely woolly or glabrate beneath, base acute rounded or cordate, cilia of the margin often gland-tipped especially at the base of the leaf; nerves 15–20 pair, oblique and nearly straight; petiole very short indeed; stipules large, linear-lanceolate, membranous, acuminate, gland-serrate. *Racemes* terminal, 1–3 in., dense-flowered. *Flowers* 8–20, white, shortly pedicelled. *Calyx-tube* turbinate; lobes obtuse and petals together 10, the latter minute unequal linear-oblong. *Stamens* 20–30. *Carpels* 1 or 2, fusiform, quite glabrous, tapering into short or long styles with discoid stigmas. *Drupe* ½ in., broadly ovoid; epicarp thin; stone thickly crustaceous, quite smooth.

2. **M. pedicellata,** *Hook. f.*; flowers subcorymbose on long slender pedicels on a short peduncle.

MISHMI HILLS, *Griffith.*

I have very imperfect scraps of this curious species, in unripe fruit only, the pedicels are 2 in. long and each flower has the unripe oblong-carpels ⅓ in. long.

5. PYGEUM, *Gærtn.*

Evergreens trees or shrubs. *Leaves* alternate, persistent, usually quite entire; stipules minute, fugacious, basal glands 2 or 0. *Flowers* small, racemose, sometimes unisexual by want of the ovary. *Calyx-tube* obconic urceolate or campanulate, deciduous; limb 5–15-toothed, often unequally. *Petals* minute, 5–6 in the 5–6-toothed calyx, 0 in the 10–15-toothed, villous or tomentose rarely glabrous, often undistinguishable from the calyx-lobes. *Stamens* 10–50, in one or more series at the orifice of the calyx-tube, filaments slender incurved; anthers small. *Carpel* 1, basal in the calyx-tube, ovoid or subglobose; style terminal, slender, exserted from the bud, stigma capitate; ovules 2, collateral, pendulous. *Fruit* a transversely oblong obscurely didymous rarely subglobose drupe, pericarp thin, dry or juicy. *Cotyledons* very thick, hemispheric; radicle minute, superior. DISTRIB. Species about 20, Tropical Asiatic and one African.

Differs from *Prunus* chiefly in the minute villous petals (when present) and form of the fruit. The often conspicuous basal pair of glands on the leaf are very variable, a few species have scattered glands, and one has bullate glands on the tip of the petiole, formed by a prolongation of the leaf-blade.

* Ovary glabrous or nearly so.

1. **P. acuminatum,** *Coleb. in Trans. Linn. Soc.* xii. 360, t. 18; leaves oblong-lanceolate caudate-acuminate quite glabrous, basal glands 0, racemes slender villous, petals 6 villous. *Kurz, For. Flor. Brit. Burm.* i. 435. Chrysobalaneus, *Wall. Cat.* 7496.

Eastern Bengal; KHASIA MTS., *Colebrooke, Wallich.* CHITTAGONG, *Kurz.*

A tree. *Leaves* 4–6 by 1½–3 in; nerves spreading: petiole ½ in. *Racemes* almost equalling the leaves, suberect, 4-angled; pedicels slender. *Flowers* yellow-green, inodorous. *Calyx* campanulate, acutely 6-toothed. *Petals* 6, clawed, ovate, villous. *Stamens* 30–40. *Ovary* glabrous; style very slender, exserted. *Drupe* 1 in. transversely, dark-purple.

2. **P. glaberrimum,** *Hook. f.*; leaves oblong-lanceolate caudate-acuminate quite glabrous, basal glands 0 or obscure, racemes slender and petioles glabrous. P. acuminatum, *Herb. Ind. Or. H. f. & T.*

Eastern tropical Himalaya, SIKKIM, alt. 3–5000 ft., J. D. H. KHASIA MTS., alt. 3–4000 ft., *Simmonds*, etc. CHITTAGONG, *J. D. H. & T. T.*

A branching tree, 30–50 ft., glabrous in all its parts, smelling strongly when bruised of prussic acid. *Leaves* 4–9 in., base rounded or acute, opaque beneath, with a few large scattered glands or 0; nerves spreading and arching; petiole ½ in. *Racemes* numerous, erect; rachis and pedicels slender. *Calyx-tube* obconic; limb obscurely 6-sinuate, disk pubescent at the base. *Petals* 6, oblanceolate, obtuse, hooded, quite glabrous. *Ovary* puberulous, soon glabrate; style slender, exserted, nearly straight; stigma capitate. *Fruit* on a much elongated thickened peduncle, 1 in. transversely.—Except for the perfectly glabrous inflorescence and petals, this closely resembles *P. acuminatum.*

3. **P. Wightianum,** *Blume, Melanges Bot.* 1855, n. 2 (*ex Walp. Ann.* iv. 642); leaves rounded-oblong or elliptic obtuse with two large glands at or near the base, racemes stout pubescent, petals 5–6 tomentose. *Thwaites Enum.* 102. P. ceylanicum, *Bedd. Flor. Sylvat.* t. 59, *excl. synon.* Polyodontia? ceylanica, *Wight. Ill.* i. 203; *Ic.* t. 256.

WESTERN PENINSULA; Anamallay, Shevarry, Pulney and Tinevelly ranges, *Beddome.* CEYLON; central province, alt. 4–8000 ft., *Wight*, etc.

A middle-sized tree, glabrous except the young shoots and inflorescence, which are pubescent with dense appressed hairs. *Leaves* 3–4 in., coriaceous, base rounded or subacute; nerves arched, spreading, prominent beneath; petiole ¼–⅓ in. *Racemes* 2–4 in.; axillary, rachis and peduncle stout; pedicels sometimes ⅓ in. long. *Flowers* ¼ in. diam. *Calyx-tube* obconic or turbinate; limb 5- rarely 4- or 6-lobed, lobes acute. *Petals* 4–6, oblong, tip rounded, softly tomentose. *Stamens* about 20. *Ovary* quite glabrous; style stout. *Fruit* ⅝ in. transversely, on very stout pedicels.

VAR. *parvifolium*, Thwaites Enum. 103; leaves smaller sometimes lanceolate, racemes shorter, pedicels very short, flowers smaller, stamens fewer, fruit ½ in. transversely.

4. **P. lanceolatum,** *Hook. f.*; leaves elliptic-lanceolate obtusely acuminate, basal glands narrow oblong, racemes rarely axillary, short few-flowered pubescent, bracts deciduous, petals 6 linear-lanceolate hairy.

SINGAPORE, *Lobb.*

Branches very slender, young ones and petioles puberulous with appressed hairs. *Leaves* 3–4 in., base very acute, rather glaucous beneath; nerves very oblique, midrib with a few silky hairs; petiole ¼–⅜ in., slender. *Racemes* ½–¾ in. chiefly on the branches below the leaves, about 10-flowered, pubescent, sometimes almost globose, subsessile; pedicels ¼ in. *Flowers* ⅓ in. diam. *Calyx-tube* turbinate, limb very shortly lobed. *Stamens* about 12; style slender. *Ovary* perfectly glabrous. *Fruit* not seen.—Differs from *P. persimile*, Kurz, in the pedicels and glabrous ovary.

5. **P. Maingayi,** *Hook. f.*; leaves elliptic-lanceolate acuminate, basal glands obscure or 0, racemes very short axillary solitary densely pubescent, bracts persistent, calyx 6-lobed, petals 0.

MALACCA, *Maingay* (*Herb. Kew*, 625).

Branchlets very slender. *Leaves* 2–3 in., rather coriaceous, base acute, nerves very faint spreading and arched, perfectly glabrous on both surfaces; petiole ¼ in., slender, glabrous. *Racemes* ⅓ in. almost globose, rusty tomentose; pedicels very short, exceeding the oblong bracts. *Calyx-tube* obconic, glabrous within; lobes oblong, obtuse, villous. *Stamens* about 15, filament slender. *Ovary* small, often abortive and slender, style glabrous. *Fruit* size of a large pea, nearly globose, with a sharp mucronate apex.

6. **P. Andersoni,** *Hook. f.*; quite glabrous, leaves oblong subacute or obtuse crenate-serrate eglandular, racemes very short axillary dense-flowered glabrous, calyx 5-lobed, petals broadly ovate with villous margins.

BENGAL, summit of Parusnath, alt. 4000 ft., *T. Anderson*.

A rigid shrub, quite glabrous except the margins of the petals. *Leaves* 3 in., coriaceous, smooth above, and bright green, paler beneath with 10–12 pairs of very faint nearly straight ascending nerves; petiole $\frac{1}{3}$ in. *Racemes* 1 in.; pedicels very short; bracts concave, obtuse. *Calyx-tube* hemispheric; lobes broadly ovate, obtuse, ciliate. *Petals* membranous, twice as large as the calyx-lobes. *Stamens* about 15. *Ovary* very minute, glabrous, imperfect.

** Ovary hirsute or villous.

† *Leaves glabrous beneath.*

7. **P. persimile,** *Kurz in Journ. As. Soc. Beng.* xli. *Pars.* 2, 306; *For. Flor. Brit. Burm.* i. 436; leaves elliptic or elliptic-lanceolate obtusely acuminate, midrib pubescent beneath, racemes 2–3, pedicels very short.

TENASSERIM, *Kurz*.

A tree; young twigs sparingly appressed-pubescent. *Leaves* obtuse and equal or unequal at the base, glabrous above or puberulous along the impressed nerves; petiole $\frac{1}{4}$ in. slender, pubescent. *Racemes* from the scars of fallen leaves, or from the branches; pedicels very short. *Calyx-tube* short, urceolate. *Ovary* densely hirsute; style long, exserted, stigma broad.—Next to *P. Lampongo* (*Kurz*, l. c.).

I have a specimen from Helfer that may be this, but it is in a most imperfect state; the basal leaf-glands are absent or very obscure, the raceme 1 in. long with persistent bracts; the calyx-tube obconic and limb with 6 oblong obtuse lobes.—A Malacca plant (*Griffith* 2052) may be referable here, but differs in the shorter stout style.

9. **P. polystachyum,** *Hook. f.*; leaves oblong obtuse young hoary beneath, petiolar glands 2 very tumid, racemes fascicled elongate finely pubescent, calyx-tube shortly 10-lobed, petals 0, stamens 40–50, style glabrous.

MALACCA, *Maingay* (*Herb. Kew*, 627).

'A tree, not lofty, with very thick trunk;' branches very stout, black, youngest and young leaves beneath clothed with very fine hoary down. *Leaves* 5–7 in., rounded at both extremities, very coriaceous, glabrous above with impressed veins, red-brown beneath with puberulous midrib and stout arching spreading nerves; petiole 1 in., very stout, with two oblong tumid glands at the apex in old leaves (not developed in the young). *Racemes* 2–4 in., axillary and from the scars of fallen leaves, hoary-pubescent, peduncle and rachis stout, strict; pedicels stout, $\frac{1}{8}$ in.; bracts 0; buds globose. *Calyx-tube* $\frac{1}{6}$ in. diam., urceolate; teeth rounded. *Stamens* in several series, filaments not longer than the calyx. *Ovary* hirsute; style stout, exserted.

10. **P. parviflorum,** *Teysm. & Binnend. in Nat. Tijd. Neerl. Ind.* ii. 309; leaves oblong obtuse, basal glands 2 large, nerves puberulous beneath, racemes fascicled on the old wood elongate tomentose, bracts deciduous, calyx limb 10–12-toothed, petals 0.—*Miquel Fl. Ind. Bat.* i. 361. P. arboreum, *Endl. Gen. Pl.* 1250 in part. Polydontia arborea, *Blume Bijd.* 1105. Polystorthia, *Blume Præf. Flor. Jav.* viii. *partim.*

MALACCA, *Griffith, Maingay*.—DISTRIB. Java, Borneo.

A tree; branches stout, lenticellate; young branchlets and racemes tomentose. *Leaves* 4–6 in., variable in length and breadth, coriaceous, base usually rounded; nerves strong arching and spreading; midrib with fine appressed hairs; petiole $\frac{1}{4}$–$\frac{1}{3}$ in. *Racemes* 1–3 in. long; peduncle and rachis stout; pedicels short; buds almost globose. *Calyx* urceolate; teeth small, obtuse, villous. *Stamens* about 20. *Ovary* densely villous; style slender, hairy. *Fruit* $\frac{1}{2}$ in. transversely, clothed with deciduous hairs.—Bornean specimens have no basal leaf-glands.

11. **P. brevifolium,** *Hook. f.*; leaves broadly oblong acute or obtuse quite glabrous beneath, basal glands minute or 0, racemes axillary globose tomentose, calyx-limb 5–6-toothed, petals 0.

MALACCA, summit of Mt. Ophir, *Griffith, Lobb.*

A shrub, 3–4 ft.; branches woody and leaves quite glabrous. *Leaves* 2–2½ in., coriaceous, usually contracted at the tip and obtuse or emarginate, rarely acute; nerves beneath faint, spreading and arching; petiole ¼–⅙ in. *Racemes* contracted, not ⅓ in. long, 6–10-fld; bracts small; pedicels short. *Calyx* urceolate; teeth unequal, obtuse. *Stamens* 10–16, filaments short. *Ovary* villous; style rather short, glabrous.

A specimen of this marked 'Lucon, T. Lobb,' in Herb. Hook., is probably so ticketed by mistake. Lobb having visited Mt. Ophir no doubt collected it there.

12. **P. Gardneri,** *Hook. f.*; leaves ovate or ovate-lanceolate acuminate, basal glands 0, racemes axillary stout elongate pubescent, bracts deciduous, calyx 12-lobed, petals 0, stamens 12 short. Pygeum ? acuminatum, *Wight Ic.* t. 993. P. zeylanicum, *Dalz. & Gibs. Bomb. Flor.* 89, *excl. Synon., not of Gærtn.*

Western Peninsula, NILGHIRI HILLS, *Gardner, Wight.* GHATS OF BOMBAY, *Ritchie.*

A large tree, glabrous everywhere except the inflorescence. *Leaves* 4–6 in., very coriaceous, base acute or rounded, equal or unequal, nerves oblique; petiole ½–1 in., quite glabrous, or of young leaves silky. *Racemes* 3–4 in., peduncle and rachis stout; pedicels short, stout. *Flowers* ¼ in. diam. *Calyx-tube* urceolate; limb with 10–12 obtuse tomentose lobes. *Petals* 0. *Stamens* 12, rather slender. *Ovary* hirsute; style exserted. *Fruit* 1–1¼ in., transversely 2-lobed, shining and smooth, apiculate in the sinus at the top.

†† *Leaves more or less pubescent beneath.*

13. **P. ceylanicum,** *Gærtn. Fruct.* i. 218, t. 46; branches leaves beneath and inflorescence densely finely tomentose, leaves oblong-lanceolate obtusely acuminate, basal glands large, racemes solitary, calyx obconic obscurely 6-toothed, petals 6 acuminate, stamens about 12. *Thwaites Enum.* 102. *excl. Syn.* P. acuminatum. P. Walkerii, *Blume Mel. Bot.* 1855 *n.* 2 (*ex Walp. Ann.* iv. 642). Polyodontia Walkerii, *Wight. Ill.* i. 203.

CEYLON, warm moister parts of the island, ascending to 3000 ft., *Walker,* &c.

A rather large tree; branches stout, lenticellate. *Leaves* 5–6 in., coriaceous, base rounded; nerves rather obliquely ascending, upper surface quite glabrous, under closely and finely tomentose. *Racemes* axillary or from the axils of fallen leaves, 1½–2 in., densely rusty-tomentose pedicels short, stout, bracts not seen. *Calyx-tube* villous within, teeth obscure. *Petals* villous, hooded. *Ovary* villous; style glabrous.

14. **P. capitellatum,** *Hook. f.*; branchlets and leaves beneath finely pubescent, leaves broadly oblong obtuse, basal glands rather large, racemes axillary contracted into globose densely villous heads, calyx-tube campanulate obscurely 10-lobed, petals 0, stamens about 15, style hairy.

TENASSERIM, *Helfer.*

Branchlets rather stout, densely pubescent. *Leaves* 5–6 in., coriaceous, base rounded, midrib stout, pubescent above, tomentose beneath; nerves rather numerous, 8–10 pair, spreading and arched; petiole ¼ in. *Racemes* solitary or crowded, sessile, ½ in. long, very dense-flowered; pedicels very short. *Calyx*-limb tomentose on the margin. *Stamens* longer than the calyx. *Ovary* villous; style rather short, with long hairs.

15. **P. montanum,** *Hook. f.*; leaves oblong-lanceolate caudate-acuminate ciliate rugulose above, pubescent or tomentose beneath, basal glands deeply

sunk, racemes densely tomentose, calyx urceolate 5-toothed, petals 5 acute, stamens 12–15, style hairy. Chrysobalanea arborescens, *R. Br. in Wall. Cat.* 7507.

Eastern Himalaya, SIKKIM, *Herb. Griff.* KHASIA MTS., alt. 3–4000 ft, *Gomez*, &c.
A small tree; branches stout, young with short stiff hairs, older lenticellate. *Leaves* 4–7 in., coriaceous, young with appressed hairs on the upper surface and densely ciliate margins, base subacute or rounded, tip finely acuminate, above glabrous except the impressed midrib, beneath clothed with short rather stiff hairs; nerves 10–12 pair, obliquely ascending, prominent and reticulate beneath; petiole very short, $\frac{1}{6}$ in., stout. *Racemes* 1–1$\frac{1}{2}$ in., solitary or fascicled on the old wood; pedicels short; bracts not seen. *Flowers* $\frac{1}{5}$ in. diam. *Calyx* with 5 subulate remote teeth. *Petals* villous, ovate-lanceolate. *Ovary* densely villous; style slender.

15. **P. Griffithii,** *Hook. f.*; branchlets and inflorescence densely tomentose, leaves oblong or oblong-lanceolate obtuse or obtusely cuspidate minutely puberulous beneath obscurely sinuate-toothed, basal glands small, racemes very short stout, flowers sessile, calyx 6-toothed, petals 0.

MALACCA, *Griffith.*
Branchlets stout. *Leaves* 5–6 in., coriaceous, base rounded or acute, most minutely dotted on both surfaces, smooth and glabrous above with puberulous impressed midrib and nerves, margin ciliate and obscurely toothed, beneath finely puberulous with 8–10 pair of spreading arching pubescent nerves; petiole $\frac{1}{6}$ in., very stout. *Racemes* $\frac{1}{3}$ in. long, axillary, solitary, few-flowered, densely tomentose, rachis very short. *Flowers* apparently quite sessile. *Calyx-tube* obconic, teeth oblong. *Stamens* 12. *Ovary* globose, hairy.—I have seen but one specimen and the description of the flowers is from Griffith's MSS. The sinuated margin of the leaf is a remarkable character.

16. **P. arboreum,** *Endl.*; *Kurz For. Flor. Brit. Burm.* i. 435; leaves ovate-oblong or broad-oblong shortly cuspidate glabrous or rusty-tomentose above, brown pubescent or almost tomentose beneath, racemes elongate 2–3 together in the axils of fallen leaves.

MARTABAN hills to TENASSERIM, alt. 3–4000 ft.. *Kurz.*
A tree, young branches and buds rusty-tomentose. *Leaves* 4–6 in., rigidly chartaceous or almost coriaceous, almost wrinkled above. *Racemes* 2–3 in., pedicels $\frac{1}{12}$–$\frac{1}{10}$ in. *Calyx-teeth* minute. *Petals* hardly longer, villous. *Ovary* densely rusty villous. *Drupe* almost $\frac{1}{2}$ in. transversely, almost didymous, covered with fugacious rusty-brown stiff hairs, soon glabrescent.—I have taken the description from Kurz, having seen no specimens. Miquel divides the *P. arboreum*, Endl. (Gen. Plant. 1250) into two species, *P. parviflorum*, Teysm. & Binnend., and *P. latifolium*, Miq. The former with a hirsute and the latter with an almost glabrous ovary—both are Javanese.

DOUBTFUL SPECIES.

Maingay's No. 628 (Distrib. Kew) from Malacca not being in flower is undeterminable; it has slender glabrous branchlets, oblong-lanceolate caudate-acuminate quite glabrous rather membranous leaves 3–4 in. long, with short slender petioles, very short racemes, fruit the size of a large pea, transversely elliptic-globose.

6. PRINSEPIA, *Royle.*

A glabrous spinous shrub. *Leaves* deciduous, lanceolate or obovate; stipules minute, deciduous. *Flowers* in short axillary racemes on the sides of the spines. *Calyx* persistent, tube cupular; lobes 5, unequal, orbicular, imbricate in bud. *Petals* 5, orbicular shortly clawed. *Stamens* numerous, many-seriate,

inserted on the mouth of the calyx-tube, filaments short; anther-cells often unequal, separated by a broad connective. *Carpel* 1, sessile; style basal, ascending, stigma capitate; ovules 2, collateral, pendulous. *Drupe* obliquely ellipsoid or cylindric, with the remains of the style at its base; epicarp thin; stone coriaceous, smooth. *Seed* erect, cotyledons amygdaloid, radicle inferior.

1. **P. utilis,** *Royle Ill.* 206, t. 38, f. 1; *Brandis For. Flor.* 196; *Wall. Cat.* 8554.

Dry rocky hills on the temperate Himalayas, alt. 4–8000 ft., from HAZARA to SIKKIM ascending to 9000 ft., and BHOTAN; KHASIA MTS., alt. 5–6000 ft.

A shrub, 3–5 ft.; branchlets green, soft, pubescent when young; pith septate. *Leaves* 1–5 in., coriaceous, acuminate, entire or serrate. *Flowers* ¼ in. diam., white, usually opening in autumn. *Drupes* ½–⅔ in. purple, subtended by the withered calyx.

7. SPIRÆA, *Linn.*

Perennial herbs or shrubs. *Leaves* alternate, simple or compound; stipules free or adnate to the petiole, rarely 0. *Flowers* in axillary or terminal cymes, white or red. *Calyx* persistent, lobes 4–5, imbricate or valvate in bud. *Petals* 4–5. *Stamens* 20–60, filaments free or connate below. *Disk* fleshy, often hairy. *Carpels* 5 or more, free or connate below; styles subterminal; ovules 2 or more, pendulous. *Follicles* 5 or more, few-seeded.—DISTRIB. Temperate and cold regions of the N. hemisphere; species 50.

SECT. I. **Ulmaria.** Herbs. *Leaves* pinnatisect. *Disk* obsolete. *Carpels* free; ovules 2.

1. **S. vestita,** *Wall. MSS.*; lateral leaflets small or 0, terminal very large acutely palmately 3–5-lobed, stipules ½-orbicular, cymes proliferous. S. Kamtschatica, *Wall. Cat.* 704 (not of Pallas). S. Kamtschatica, *var.* himalensis, *Lindl. in Bot. Reg.* 1841, t. 4.

Western temperate Himalaya, from KASHMIR to KUMAON, alt. 7–12,000 ft.—DISTRIB. Kamtschatka.

A herb, with perennial root, 1–1½ ft., pubescent except the leaves above. *Leaves* sometimes hoary with thick white tomentum beneath, lateral lobes very variable, ⅙–1½ in., sessile, ovate, acutely toothed; terminal lobe 2–6 in. diam., palmately 3–5-lobed; lobes acuminate, acutely lobulate and toothed. *Cymes* oblong, much branched, very many-flowered. *Flowers* white, ¼ in. diam. *Calyx* small, lobes obtuse. *Petals* oblong-orbicular. *Carpels* many, villous, 2-ovuled.—Very similar indeed to *S. Kamtschatica,* a plant confined to the country whose name it bears, and to Mantchuria, but quite distinct by the stipules.

SECT. II. **Aruncus.** Diœcious herbs. *Leaves* triternately pinnate. *Disk* tumid. *Carpels* free; ovules many.

2. **S. Aruncus,** *Linn.*; *Led. Fl. Ross.* ii. 16; leaflets ovate caudate-acuminate acutely doubly-serrate glabrous or silky beneath, stipules obsolete, cymes panicled pubescent. *Pallas Flor. Ross.* t. 26; *Boiss. Fl. Orient.* ii. 690. *Don Prodr.* 228. S. triternata, *Wall. Cat.* 706.

Western and Central temperate Himalaya; from SIRMORE, alt. 10,000 ft., *T. Thomson,* to NEPAL, *Wallich.*—DISTRIB. From West Europe to Kamtschatka and Mantchuria, Japan and E. and W. N. America.

A slender herb, 2–4 ft., with stout perennial rootstock. *Leaves* with long primary and secondary petioles, petiolules short; leaflets 1–2 in. (1–10 in. in Japan specimens) rather membranous. *Flowers* dense, white, ¼ in. diam. *Calyx-tube* turbinate, lobes

oblong-ovate. *Petals* orbicular. *Carpels* 6–8, tumid, glabrous and shining when ripe. The Indian form has smaller and more numerous carpels than the European.

SECT. III. **Sorbaria.** Shrubs. *Leaves* pinnate. *Disk* adnate to the calyx-tube. *Carpels* connate below; ovules many.

3. **S. sorbifolia,** Linn.; *Led. Fl. Ross.* ii. 15; leaflets 6–9 pair sessile lanceolate- or linear-oblong acuminate doubly serrate glabrous or hairy beneath, stipules linear-subulate, cymes in branched panicles. *Pall. Flor. Ross.* t. 24, 25. S. Lindleyana, *Wall. Cat.* 703; *Lindl. in Bot. Reg.* t. 33.

Western temperate Himalayas; from KUNAWUR to KUMAON, alt. 7–10,000 ft.—DISTRIB. Altai Mts. to N. China and Japan.

A tall shrub, glabrous or with soft hairs in the young parts, leaflets beneath and inflorescence. *Leaves* 8–12 in.; leaflets 2–4 in., sessile, gradually narrowed from near the usually rounded base to the long tip; terminal sometimes lobed at the base; petiole cylindric. *Flowers* white, $\frac{1}{4}$ in. diam. *Calyx-tube* hemispheric; lobes rounded. *Petals* orbicular. *Carpels* 5, glabrous or pubescent; ripe oblong, dehiscing dorsally.

SECT. IV. **Chamædrya.** Shrubs. *Leaves* simple *Disk* adnate to the calyx-tube, glandular. *Carpels* free; ovules many.

4. **S. callosa,** *Thunb. Fl. Jap.* 209; leaves oblong-ovate or -lanceolate acuminate doubly inciso-serrate glaucous and pubescent or glabrate beneath, cymes much branched pubescent, flowers hermaphrodite, bracteoles equalling the calyx, ripe carpels exposed glabrate. *Lindl. & Paxt. Fl. Gard.* ii. 113, fig. 191. S. callosa, var. ε. robusta, *Hook. f. & Thoms. Herb. Ind. Or.* S. Fortuni, *Planch. in Flor. des Serres,* ix. 871; *Lindl. & Paxt. Fl. Gard.* ii. 113, with a woodcut *Bot. Mag.* t. 5164.

KHASIA MTS. at Kullung rock, and the Boga Panee, alt. 5–6000 ft., *Simmons, J. D. H. & T. T.*—DISTRIB. N. China, Japan.

An erect or straggling shrub, with pubescent or tomentose or glabrate striate branches. *Leaves* 1–4 in., glabrous and glaucous beneath, or more or less pubescent or tomentose, those on young twigs sometimes rhomboid-ovate; petiole very short. *Flowers* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., in very open corymbose spreading cymes, pale or deep rose-red, *Calyx-tube* obconic; lobes triangular-ovate, pubescent. *Petals* orbicular. *Disk-glands* prominent. *Ripe carpels* $\frac{1}{6}$ in., dark brown, glabrous, shining; styles nearly as long as the valves.—I have described this from Khasia specimens, which are usually tomentose on the under surface of the leaf, but some specimens are as glabrous as the Japanese. It is remarkable that neither Jenkins, Wallich, nor Griffith had it from the Khasia Mts.

5. **S. bella,** *Sims, Bot. Mag.* t. 2426; leaves broadly oblong ovate or ovate-lanceolate doubly inciso-serrate or crenate glaucous and glabrate or pubescent beneath, cymes much branched pubescent, flowers subdiœcious, bracteoles equalling the calyx, ripe carpels exposed glabrate. *Don Prodr.* 227; *Kunze in Linnæa,* xx. 60. S. callosa and fastigiata, *Wall. Cat.* 707, 708. S. glauca and stellata, *Wall. MSS.* S. expansa, *Wall. Cat.* 702.

Temperate Himalaya from SIRMORE alt. 7–10,000 ft., to SIKKIM and BHOTAN, alt. 6–12,000 ft.

A very variable plant, unless, as is probable, two species may be confounded under the above description, which however have not been distinguished by any botanist.—A shrub 2–6 ft.; branches erect or inclined or horizontal. *Leaves* $\frac{1}{2}$–2 in., glaucous beneath and usually glabrate, but sometimes pubescent. The extreme forms are those of *S. bella* proper (*callosa,* Wall. *not* Thunb.) in which they are broad ovate or oblong obtusely toothed towards the apex only, and of *fastigiata,* Wall., in which they are much larger ovate-lanceolate acuminate and inciso-serrate throughout; the

latter is usually a more erect plant, with shorter stricter stouter stems, and closely resembles *S. callosa*, differing chiefly in the apparently more or less diœcious flowers. *S. bella* proper, on the other hand, is more slender, often nearly prostrate, with arched branches; there are however all manner of intermediate forms, and some specimens have both types of leaf. *Flowers* pink, or rarely white. *Calyx-lobes* acute, tube villous within. *Stamens* minute and deformed in the ♀ flowers, long in the ♂. *Ovaries* small or absent, those of the ♂ flowers with long styles, of the ♀ short. *Disk* of broad incurved scales. *Ripe carpels* as in *S. callosa.*

6. **S. micrantha,** *Hook. f.*; leaves ovate-lanceolate acuminate doubly inciso-serrate glaucous hairy beneath, cymes very broad lax and open, bracteoles filiform often exceeding the calyx, flowers subdiœcious, ripe carpels exposed villous. S. callosa *var.* macrophylla, *Hook. f. & Thoms. Herb. Ind. Or.*

Eastern temperate Himalaya; SIKKIM alt. 6–8000 ft. *J. D. H.*; BHOTAN, alt. 5800–10,000 ft., *Griffith.*

Very similar to the *fastigiata* form of *S. bella*, but more lax in habit, leaves sometimes 7 in., very membranous or coriaceous. *Flowers* $\frac{1}{6}$–$\frac{1}{4}$ in. diam., in very long spreading panicles, pale coloured. *Disk-glands* large. *Calyx-tube* villous within. *Bracteoles* filiform, often much produced. *Ripe carpels* much smaller than in *S. callosa* and *bella*, clothed densely with spreading hairs.

7. **S. canescens,** *Don Prodr.* 227; softly tomentose, branches stout arching, leaves small subsessile obovate or cuneate-obovate quite entire or obtusely 3–5-toothed at the tip, corymbs small compound, flowers hermaphrodite, ripe carpels half sunk in the calyx-tube villous. S. cuneifolia. *Wall. Cat.* 699; *Lindl. in Bot. Reg.* 1839, *Misc.* 59; *Camb. in Jacq. Voy. Bot.* 47, t. 57.

Temperate Himalaya from KASHMIR to KUMAON alt. 6–12,000 ft., and in SIKKIM alt. 10–12,000 ft.

A shrub, 6 ft., with densely leafy branches. *Leaves* $\frac{1}{2}$–$\frac{2}{3}$ in., coriaceous, acute or obtuse; nerves very oblique; petiole very short. *Corymbs* very numerous, 1–1$\frac{1}{2}$ in. diam. *Flowers* pale pink or white, $\frac{1}{6}$ in. diam. *Stamens* not exceeding the petals. *Disk* with broad notched glands. *Ripe carpels* sunk half or whole way in the turbinate calyx-tube.

8. **S. arcuata,** *Hook. f.*; glabrate, branches stout arched, leaves small petioled obovate obtusely 3–8-toothed or -lobed at the rounded top rarely entire and acute, corymbs small compound puberulous, flowers hermaphrodite, ripe carpels wholly exserted glabrous shining. S. canescens, *var.* glabra, *Herb. Ind. Or. H. f. & T.*

SIKKIM HIMALAYA, subalpine; Yemutong and Lachoong, alt. 12–14,000 ft., *J. D. H.*; Jongri, *C. B. Clarke.*

A small woody ramous shrub, with very stout horizontal arching glabrous dark brown shining deeply grooved branches, flowering branches very short. *Leaves* $\frac{1}{2}$ in., glabrous or nearly so, narrowed into a slender petiole. *Corymbs* dense-flowered. *Flowers* $\frac{1}{3}$ in. diam., red. *Stamens* not exceeding the petal. *Disk* with broad notched glands. *Ripe carpels* not at all sunk in the turbinate very short calyx-tube.—Closely allied to *S. canescens*, but more robust and glabrate, with more petioled leaves, larger red flowers and very different fruit.

9. **S. vaccinifolia,** *Don Prodr.* 227; leaves small petioled ovate or elliptic-lanceolate acute or obtuse serrate or crenate glaucous and hoary beneath, corymbs much branched tomentose, flowers hermaphrodite, ripe carpels glabrous. *Lindl. in Bot. Reg.* 1839, *Misc.* 60; 1840, t. 17. S. laxiflora, *Lindl. in Bot. Reg.* 1839, *Misc.* 60; *Lindl. & Paxt. Fl. Gard.* ii. 98, fig. 183. S. rhamnifolia, *Wall. Cat.* 700.

Western temperate Himalaya; from MURREE to KUMAON.

An erect shrub, with strict hoary branches. *Leaves* ⅓–1½ in., usually elliptic and acute at both ends, serratures or crenatures small; nerves beneath faint; petiole ⅛–¼ in., slender. *Corymbs* dense-flowered; flowers small, ⅙ in. diam. *Ripe carpels* minute, glabrous, half sunk in the villous calyx-tube.

10. **S. parvifolia,** *Bert. Piant. Nuov. Asiat*. ii. 10, t. 4, glabrous, leaves broadly ovate or orbicular obtuse crenate glaucous beneath, petiole slender, corymbs in lax spreading rounded glabrous panicles with very slender peduncles and pedicels, flowers hermaphrodite, ripe carpels glabrous. T. chamædrifolia, *Hook. f. & Thoms. Herb. Ind. Or., not of Linn.* ? S. vaccinifolia, *Lodd. Bot. Cab.* t. 1403, *not of Don.*

Western temperate Himalaya; KISHTWAR alt. 6–8000 ft., *T. Thomson.*

A graceful shrub, with slender branches, and drooping floriferous branchlets, glabrous throughout or with minutely downy inflorescence. *Leaves* ¾–1 in., very rarely ovate acute and serrate, usually broadly elliptic, thin and almost membranous, flat; nerves very indistinct on both surfaces. *Inflorescence* sometimes of many simple corymbs with long capillary pedicels (sometimes ½ in.) collected into lax broad panicles that terminate drooping lateral branches; in other specimens the corymbs are branched as in *S. bella*, &c. *Flowers* ⅙ in. diam. *Ripe carpels* very small, $\frac{1}{12}$ in., half sunk in the calyx-tube, glabrous.—Very near *V. chamædrifolia*, L., of Siberia, and perhaps a form of that plant with smaller flowers and laxer habit; it is the only Himalayan species with the ultimate branches of the inflorescence bearing corymbose pedicels. Except that the leaves are acute, which is rarely the case in our plant, the figure of *S. vaccinifolia* in Loddiges admirably accords with it. Loddiges says that he raised it from seeds sent from Nepal.

11. **S. brahuica,** *Boiss. Flor. Orient.* ii. 690; a small excessively branched shrub, leaves minute obovate-cuneate entire or 3–5-lobed or -toothed tomentose, corymbs few-flowered, carpels minute.

WUZURISTAN beyond Peshawur in N. W. India, alt. 5–8000 ft., *Stewart*.—DISTRIB. Beloochistan.

A very remarkable little species, forming a low shrub with slender stiff interlaced sometimes spinescent branches. *Leaves* ¼–½ in., usually glabrous or puberulous above, and white with dense pubescence beneath, but in some of Stock's Beluchistan specimens nearly glabrous on both surfaces; petiole very short. *Flowers* ⅙ in. diam., in shortly peduncled tomentose panicles.

DOUBTFUL SPECIES.

S. VENUSTULA, *Kunth & Bouch. Ind. Sem. Hort. Berol.*, 1848, 16, No. 27; *Walp. Ann.* ii. 521; S. PULCHELLA, *Kunze in Linnæa*, xx. 60; and S. NEPALENSIS, *Hort. Loddiges*, are no doubt forms of *S. bella*.

S. NUTANS, Royle (*argentea*, Loudon), is unknown.

S. CŒRULESCENS, *Poir. Dict.* vii. 350; *Camb. Monog. in Ann. Sc. Nat.* i. 374; *DC. Prodr.* ii. 544, brought from India by Sonnerat, with axillary panicles, is unknown, but as Sonnerat was never in any part of India where Spiræa is indigenous, his plant is possibly the garden *S. cantoniensis*, Lour.

S. CORYMBOSA, *Roxb. Fl. Ind.* ii. 512. S. chamædrifolia, *L.? Wall. Cat.* 701, is S. CANTONIENSIS, *Lour.*, a native of China only (see Benth. Fl. Hong Kong, 105) and not of the N. of India.

8. RUBUS, *Linn.*

Creeping herbs or erect or sarmentose shrubs, almost always prickly. *Leaves* alternate, simple or compound; stipules free or adnate to the petiole. *Flowers* in terminal and axillary corymbose panicles, rarely solitary, white or red. *Calyx-tube* broad; lobes 5, persistent. *Petals* 5. *Stamens* many. *Disk* coating the calyx-tube. *Carpels* many, on a convex receptacle; style subterminal; ovules 2, collateral, pendulous. *Drupes* many, 1-seeded, crowded upon a dry or spongy

conical or cylindric receptacle. *Seed* pendulous.—DISTRIB. Abundant in the northern hemisphere, rare in the southern; species 100.

A genus of which the western European species are notoriously difficult of discrimination, as are some of the Himalayan.

SERIES 1. Leaves simple, undivided or lobed.

* Herbs with creeping or prostrate stems.

1. **R. calycinus,** *Wall. in Don Prodr.* 235; *Cat.* 737; eglandular, stem and petioles hirsute and prickly, leaves orbicular-reniform obscurely lobed toothed hairy above glabrous beneath except on the prickly nerves, flowers axillary, calyx densely prickly, lobes deeply toothed. R. lobatus, *Wall. MSS.* Dalibarda calycina, *DC. Prodr.* ii. 568.

Central and Eastern temperate Himalaya; NIPAL, *Wallich.* SIKKIM alt. 6–9000 ft. BHOTAN alt. 8500 ft. KHASIA MTS. alt. 4–5000 ft.

Almost black when dry; prickles slender, slightly curved on stem and petioles. *Stem* creeping for 1–3 ft. *Leaves* 1–3 in. diam., sometimes hairy beneath; petiole 2–4 in.; stipules $\frac{1}{4}$–$\frac{1}{2}$ in., broadly ovate, serrate. *Flowers* 1 in. diam., solitary or twin, usually on erect 1–2-leaved shoots. *Calyx-tube* densely clothed with long straight prickles; lobes foliaceous, broad. *Petals* shorter than the calyx-lobes, erect in fruit. *Fruit* globose of few large scarlet fleshy carpels; stone rugose.—Very near a Philippine Island species which has stipules cut into narrow lobes and smaller flowers.

** Shrubs, erect sarmentose or climbing.

† *Leaves oblong, entire* (*obscurely lobulated in* R. assamensis); *stipules pectinate* (*except in* R. acuminatus *and* Griffithii). *Carpels few,* 6–12.

2. **R. acuminatus,** *Sm. in Rees Cyclop.* xxx. *Rubus* 43; eglandular, quite glabrous, prickles very few scattered curved, leaves ovate or lanceolate caudate-acuminate doubly serrate, flowers small corymbose long pedicelled, corymbs axillary and in elongated terminal panicles, bracts setaceous glandular, calyx-lobes ovate glabrous with pubescent margins, carpels about 8. *Wall. Cat.* 726. R. oxyphyllus, *Wall. Cat.* 7110. R. betulinus, *Don Prodr.* 233. R. triflorus, *Ham. MSS.*

Central and Eastern temperate Himalaya from KUMAON, *Blinkworth,* and NEPAL to SIKKIM, alt. 4–7000 ft. KHASIA MTS. alt. 4–5000 ft.

Scandent. *Branches* long, arching, cylindric; prickles very small, flattened, rarely on the petioles. *Leaves* 3–5 in., rather membranous; base rounded; nerves 6–8 pair; petiole slender, $\frac{1}{2}$–$\frac{2}{3}$ in.; stipules slender, almost setaceous, glandular. *Panicles* sometimes a foot long; bracts small. *Flowers* $\frac{1}{3}$ in. diam., in threes or fives; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. *Calyx-lobes* with recurved or hooked sometimes dorsal tips, erect in fruit. *Petals* much shorter than the calyx, white. *Carpels* glabrous. *Fruit* of large globose scarlet drupes enclosed by the calyx, receptacle villous, stone rugose.

3. **R. Griffithii,** *Hook. f.*; eglandular, branches and leaves glabrous, prickles few scattered curved, leaves oblong-lanceolate caudate acuminate doubly serrate, panicles axillary and terminal elongate, flowers sessile scattered or crowded, bracts linear-oblong serrate, calyx hoary with appressed down.

Eastern Himalaya; SIKKIM, *Herb. Griffith.*

Very similar to *R. acuminatus* in foliage, but with very short petioles, a totally different inflorescence, the flowers never in corymbs or fascicles, a densely tomentose calyx, and linear serrated bracts.—I have seen but one specimen, which is in bud only. Possibly the locality is erroneous, as Griffiths' collections were in great confusion and it was often difficult to decipher the localities.

4. **R. hexagynus,** *Roxb. Hort. Beng.* 39; *Fl. Ind.* ii. 516; eglandular,

pubescent tomentose or glabrate, prickles short stout recurved, leaves oblong obtuse acute or acuminate serrate, stipules pectinate, panicles terminal, bracts tomentose pectinate not exceeding the buds, calyx hoary with white down, petals small, carpels 6. *Wight & Arn. Prodr.* 299; *Wall. Cat.* 725 *in part*; R. indicus, *Lesch. in DC. Prodr.* ii. 568. R. pyrifolius, *Herb. Ind. Or. Hook. f. & T. in part, not of Smith*; *Kurz For. Flor. Brit. Burm.* i. 436.

ASSAM, SILHET and the KHASIA MTS. ascending to 4500 ft. Katchyen hills, AVA, *Kurz.*—DISTRIB. Yunan.

Climbing; stem as thick as the arm; prickles flattened. *Leaves* $1\frac{1}{2}$–4 in., usually cordate at the base, glabrous above, beneath pubescent or tomentose wholly or on the nerves only, usually rugose when dry, not shining; nerves 8–10 pair, spreading and arched; midrib beneath prickly; petiole short, $\frac{1}{4}$ in., stout, tomentose; stipules white and hoary, with no lamina. *Panicles* large and spreading, densely white-tomentose; bracts $\frac{1}{6}$–$\frac{1}{4}$ in. *Flowers* $\frac{1}{3}$–$\frac{1}{2}$ in. diam. *Calyx-lobes* erect in fruit, villous within, entire, rarely 3-fid at the tip. *Petals* linear, white, shorter than the calyx. *Carpels* glabrous, with very slender styles. *Fruit* of 1–6 large red-purple drupes; receptacle villous; stone rugose.—This and the following have been usually confounded with the Java *R. pyrifolius* which has shorter leaves with fewer and more oblique nerves.

5. **R. Hamiltoni,** *Hook. f.*; eglandular, glabrous or pubescent, prickles short stout recurved, leaves oblong-ovate or -lanceolate acuminate serrate, stipules pectinate, panicles terminal, bracts glabrous pectinately laciniate far exceeding the buds, calyx with appressed hairs, tips of lobes long acuminate usually laciniate, petals small, carpels 6. R. pyrifolius, *Ham. in Herb. Wall. not of Smith*; *Wall. Cat.* 725 *in part.*

Central and Eastern tropical Himalaya; BHOTAN alt. 5000 ft., *Griffith*; SIKKIM alt. 2–3000 ft., *J. D. H.* ASSAM, *Hamilton*, *Masters*, &c.

Very similar to *R. hexagynus*, but readily distinguishable by its brown colour when dry, usually narrower and more acuminate leaves, less tomentose inflorescence, which is nearly black when dry, and by the very large pectinately laciniate curved bracts which are membranous and curving over the young buds give a curiously crinite appearance to the immature panicles; the sepals also have usually longer tips split into setaceous lobes. Fruit as in *R. hexagynus.*

6. **R. assamensis,** *Focke Batogr. in Abhandl. Naturwiss. Verein, Bremen*, iv. 197 (1874); eglandular, branches petioles and panicles villous with soft spreading hairs, prickles very few short, leaves oblong or ovate-oblong very obscurely lobed acuminate toothed hairy above hoary with whitish down beneath, nerves 5–6 pairs, petioles very short, panicles triangular, flowers small, calyx-lobes tomentose, carpels 10–12 glabrous. *Rubus* 20 *Herb. Ind. Or. H. f. & T.*

MISHMI HILLS, *Griffith*, and KHASIA MTS. at Syong, alt. 5500 ft., *H. f. & T.*

An erect whitish shrub; prickles hooked. *Leaves* 3–4 in., acute or obtuse at the base, rarely subcordate, nerves very oblique, margins sometimes without trace of lobing; petiole $\frac{1}{4}$ in.; stipules woolly, small, pectinately pinnatifid. *Panicles* as broad as long, shortly pyramidal; pedicels short; bracts small, cleft half way into setaceous lobes. *Flowers* $\frac{1}{3}$ in. diam., white. *Calyx-lobes* ovate, long-acuminate, usually quite entire, erect in fruit, inner surface glabrous with a broad tomentose margin. *Petals* wholly absent in Khasia specimens. *Carpels* with a few long hairs and very long styles. *Fruit* (in Mishmi specimens) globose, hardly exceeding the calyx; drupes few; receptacle villous; stone pitted.

†† *Leaves lobed at the sides towards the base, normally longer than broad; stipules pectinate. Carpels many.*

7. **R. glomeratus,** *Blume Bijd* 1111; eglandular, branches slender and leaves beneath tomentose with white or buff down, prickles minute, leaves ovate-cordate acuminate 3–5 lobed, the lateral lobes near the base of the leaf very

shallow toothed, flowers in small axillary and terminal eglandular downy panicles, calyx-lobes villous quite entire, petals obovate equalling the calyx, carpels many. R. Hasskarlii, *Miquel, Flor. Ind. Bat.* i. *pars*, 381. R. acerifolius, *Wall. Cat.* 744.

PENANG, *Wallich, Maingay.*—DISTRIB. Java, Borneo, Philippines.

This resembles a slender narrow leaved small-flowered state of *R. moluccanus*, but may at once be distinguished by the narrow leaves, lobed on each side towards the base only. The flowers are small (⅓ in. diam.) usually in loose panicles, the stipules and bracts laciniate.—I have seen in Mr. Clarke's collection a small specimen very like this from the Khasia Mts., alt. 4500 ft., but it is so difficult to distinguish imperfect specimens of this from the *paniculatus* and *moluccanus*, var. *micropetalus*, that I hesitate to include the habitat of Khasia.

8. **R. paniculatus,** *Smith in Rees Cyclop.* xxx. *Rubus* 41; eglandular, branches slender, leaves beneath and panicles clothed with white or buff cottony tomentum, prickles very few minute, leaves ovate-cordate or oblong-ovate caudate-acuminate obscurely lobed toothed, nerves 5–7 pair, panicles terminal very lax and much branched, bracts linear-oblong serrate, calyx-lobes silky usually entire, petals very small linear-oblong, carpels many glabrous. *Wall. Cat.* 749. R. tiliaceus, *Sm. l. c.*; *Wall. Cat.* 745.

Temperate Himalaya from RAJAORI, alt. 3–7000 ft. to SIKKIM, alt. 6–8000 ft. KHASIA MTS. alt. 4–5000 ft.

A very rambling climber; all parts except the leaves above densely pubescent or tomentose, with usually cottony white or buff tomentum; prickles hooked, flattened, *Leaves* 3–5 in., rarely as broad as long, rather membranous, sparsely hairy above, lateral lobes usually very obscure; midrib without prickles; petiole 1–2 in., slender, rarely with a prickle; stipules small, laciniate. *Panicles* very large and open; bracts small. *Flowers* ¾–1 in. diam., often long pedicelled. *Calyx-lobes* ovate, acute acuminate or lanceolate and caudate-acuminate, when they are often incised towards the tip, erect in fruit. *Petals* much smaller than the calyx-lobes, white. *Carpels* glabrous. *Fruit* globose, exposed; drupes many, large, black; receptacle villous; stone rugose.

9. **R. insignis,** *Hook. f.*; eglandular, clothed with buff cottony tomentum, prickles numerous short, leaves hastate-oblong acuminate toothed lobulate towards the base, nerves 12–15 pair, panicles very long lax open prickly, petals broadly obovate equalling the silky entire calyx-lobes, carpels numerous glabrous.

Eastern tropical Himalaya; BHOTAN, *Griffith.* KHASIA MTS. alt. 2–3000 ft., *J. D. H. & T. T.*; *C. B. Clarke.*

A very noble species, with the habit of *R. paniculatus*, but much larger in all but the flowers, and at once distinguished by its prickles, which extend along the petiole and midrib of the leaf beneath, by the numerous nerves, and large almost orbicular petals. Bhotan specimens have the flowers crowded at the end of the long branches of the panicle, whilst in the Khasia ones the branches are open and exceedingly lax to the end. Fruit as in *R. paniculatus.*

10. **R. ferox,** *Wall. Cat.* 724, eglandular, tomentose, prickles on the stem numerous short stout, leaves cordate sharply toothed upper ovate-lanceolate entire lower more orbicular shortly 5-7-lobed glabrous above pubescent or glabrate beneath, panicles lax-flowered, margins of calyx-lobes pectinate, petals broad, carpels about 8. *Kurz, For. Flor. Brit. Burm.* i. 437.

Central Himalaya; NEPAL, *Wallich.* KHASIA MTS., alt. 3–4000 ft., *Griffith,* &c. BURMA, probably Ava, *Kurz.*

Very robust; stem and especially inflorescence and petioles densely tomentose; prickles hooked, compressed. *Leaves* not white or buff beneath; lower 3–5 in. long and broad; lobes deltoid, acute; nerves palmately spreading; petiole 1–2 in., densely

tomentose, often prickly; stipules and bracts pectinately pinnatifid. *Flowers* ½–¾ in. diam. *Calyx-lobes* broadly ovate, acute, with 2–5 long marginal teeth, densely tomentose, almost villous, erect in fruit. *Petals* as long as the calyx, white. *Filaments* hairy. *Carpels* numerous, glabrous. *Fruit* of 20–30 small drupes, stone wavy on the surface.

A specimen from Birma? in Griffith's Herb. is more glabrous with more slender petioles. *R. Finlaysonianus, Wall. Cat.* 7109, from Siam, known only from a fragment in bud, differs in the apparently entire calyx-lobes clothed with buff tomentum.

††† *Leaves normally broader than long, palmately* 5–7-*lobed*; *stipules pinnatifid or pectinate. Carpels many.*

11. **R. moluccanus,** *Linn.*; *DC. Prodr.* ii. 566; eglandular, tomentose villous or sublanate, prickles scattered short curved, leaves long-petioled usually deeply cordate broad ovate or orbicular obtusely or acutely 3–7-lobed toothed smooth scabrid or rugose above, beneath clothed with grey or yellow wool or pubescence, panicles axillary and terminal, calyx villous and silky, lobes lanceolate or ovate acute entire or with pectinate margins, carpels very many.—*Roxb. Fl. Ind.* ii. 518; *Miq. Fl. Ind. Ind. Bat.* i. part 1, 382; *Wall. Cat.* 743; *Kurz For. Flor. Brit. Burm.* i. 437. R. rugosus, *Smith in Rees Cyc.* xxx. *Rubus* 34; *Don Prodr.* 234; *Wight et Arn. Prodr.* 299; *Dalz. & Gibs. Bomb. Flor.* 89; *Thwaites Enum.* 101; *Wight. Ic.* t. 225; *Wall. Cat.* 748; *Plant. As. Rar.* iii. 19, t. 234 (*Hamiltonianus*). R. alceæfolius, *Poir. Encycl.* vi. 247. R. micropetalus, macrocarpus, and Fairholmianus, *Gardner in Calc. Journ. Nat. Hist.* viii. 6. R. cordifolius, *Don Prodr.* 233. R. reflexus, *Ker in Bot. Reg.* 461; *Benth. Hong-Kong Flor.* 104. R. Hamiltonianus. *Seringe in DC. Prodr.* ii. 566.—*Rumph. Amboin.* v. 88, t. 47, f. 2.

Central and Eastern tropical and temperate Himalaya. NEPAL, *Wallich.* SIKKIM, alt. 3–7000 ft. ASSAM; KHASIA MTS., alt. 3–5000 ft. BURMA. EASTERN PENINSULA. WESTERN PENINSULA or the Ghats from Bombay Southward. CEYLON ascending to 7000 ft.—DISTRIB. Malay Archipelago and Islands.

Stem very robust, with wide spreading subscandent branches, densely clothed with white grey or fulvous tomentum; prickles hooked, flattened. *Leaves* 2–10 in. diam., most variable in texture and pubescence; upper surface smooth or covered with tubercles answering to the spaces between the nervules; under pubescent villous or clothed with cottony wool, grey or green or buff-coloured, never quite white; petiole 2–4 in., glabrate or tomentose; stipules variable in size, oblong, toothed pinnatifid laciniate or pectinate. *Inflorescence* usually clothed with silky buff tomentum, rarely white or glabrate. *Flowers* very variable in size, from ½–1 in., in rather contracted terminal panicles and axillary capitate clusters; bracts like the stipules, never bearing gland-tipped hairs. *Calyx-lobes* ⅓–⅔ in. long, usually triangular-ovate, rarely lanceolate, and then pinnatifid in the upper part, erect in fruit. *Petals* obovate, white, shorter than the calyx-lobes. *Filaments* glabrous. *Carpels* numerous, glabrous. *Fruit* globose, succulent, of many scarlet small drupes; receptacle villous; stone rugose.

I am quite unable to arrange the form of this common and protean plant under recognisable varieties answering to its synonymy. The original *R. moluccanus*, founded on the plate and description of Rumphius, has leaves with a rugose upper surface (folia superne quam maxime rugosa) and a whitish or ochreous under surface. I have it from Assam, the Khasia Mts., Penang and Java; and with the lobes rather acute from Nepal and almost all localities, where it becomes *R. rugosus*, Sm., described as such by Wallich (Plant As. Rar.), and figured under its synonym *R. Hamiltonianus.* Specimens with acuminate leaf-lobes occur at considerable elevations in the Himalaya and Khasia Mts., where the leaves also become more membranous and very large with pale undersurface; at similar elevations and localities large leaved states occur with very large flowers, and lanceolate sepals ⅔ in. long. The branches and inflorescence of Malacca specimens are most densely

villous with spreading hairs and the basal leaf-lobes overlap. The Western Ghat specimens have the leaves rugose above and thin, and the branches and inflorescence densely clothed with firm buff cottony tomentum. This is also the case with the Ceylon specimens, of which Thwaites distinguishes 4 varieties:—*α*. bracts ovate entire or cut at the tip, fruit small red (Wight. Ic. t. 225); *β*. leaves smaller narrower more acute; stipules and bracts cut into filiform segments, petals small, fruit dark red (*R. micropetalus*, Gard.); (I should refer this to *glomeratus*, Bl.); *γ*. tomentose, pale, leaves very rugose and coriaceous, stipules and bracts less deeply cut, panicle dense, calyx-lobes ovate-lanceolate toothed, fruit dark red (*R. Fairholmianus*, Gard.); *δ*. prickles short, stipules and bracts less cut, panicles few-flowered, flowers larger, petals about equalling the calyx, fruit larger black (*R. macrocarpus*, Gard.); of these *α*. only inhabits low grounds.

8019 12. **R. reticulatus,** *Wall. Cat.* 747; eglandular, pubescent with white tomentum, prickles few minute or 0, leaves cordate-orbicular subacutely 5–7-lobed reticulated on both surfaces finely downy beneath, panicles entire or laciniate ovate acute, calyx-lobes densely tomentose, fruit globose much larger than the calyx.

Temperate Himalaya; from KUMAON, alt. 7–8000 ft., to SIKKIM, alt. 9–10,000 ft.

This I expect will prove another form of *R. moluccanus* from a higher region, the leaves of the Kumaon and Sikkim specimens are large broad and rather thin in texture; Wallich's Nepal ones are more coriaceous, narrower and elongate with many lateral lobes, more like those of *R. paniculatus*, to which Wallich says it is 'valde affinis.' Sikkim specimens have the cut calyx-lobes. The fruit is very large.

13. **R. lanatus,** *Wall. Cat.* 746; glandular, branches and leaves beneath white cottony, leaves cordate orbicular-ovate acute obscurely lobed serrate glabrous or hairy above, panicles short dense densely villous and covered with gland-tipped hairs, petals small narrowly linear-oblong, carpels numerous. R. tiliaceus, *Herb. Str. & Winterb.*

Central and Western temperate Himalayas. NEPAL, *Wallich*. KUMAON, alt. 5-8000 ft., *Madden, Strach. and Winterb.*

The very broadly ovate cordate obscurely lobed leaves, white cottony tomentum, and above all the long glandular hairs of the young shoots and inflorescence best distinguish this species, which has the other characters of *R. moluccanus*. It may be likened to a dense-flowered glandular *R. paniculatus*, with broader leaves.

14. **R. birmanicus,** *Hook. f.*; eglandular, branches petioles and leaves densely clothed with long spreading flexuous hairs, prickles very copious hooked, leaves acutely palmately 5-lobed crenate rugose above white with appressed down beneath, stipules and bracts cut into long capillary lobes, flowers large, calyx-lobes broad, petals orbicular, carpels excessively numerous.

BIRMA; in the Patkaye hills, E. of the Assam frontier, *Griffith*.

Branches flexuous, hairs red brown when dry; prickles stout recurved flattened extending to petioles and nerves beneath, but not to the panicle, compressed. *Leaves* 3–4 in. diam., rather coriaceous, lobes extending nearly half way down, triangular, dark above when dry with pubescent nerves, dirty brownish white beneath; petiole 1½ in., stout; stipules ½ in., as broad as long across the almost capillary divisions. *Panicle* (in bud only) narrow with short branches, and bracts as large as the stipules; buds very broadly ovoid, densely tomentose but not hairy like the peduncles and pedicels. *Calyx-tube* hemispheric, lobes broad subacute, entire. *Petals* equalling the calyx-lobes, clawed. *Stamens* excessively numerous, in many series. *Carpels* upwards of 100, glabrous, styles very slender with a few hairs on the stigma; receptacle villous.—A very remarkable species.

8020 15. **R. Treutleri,** *Hook. f.*; more or less glandular, softly tomentose with spreading flexuous hairs, prickles slender nearly straight, leaves orbicular-

cordate with 5–7 shallow crenate lobes, stipules leafy pectinate, flowers large solitary clustered or in short panicles, bracts leafy persistent, petals orbicular small, carpels very numerous hairy.—Rubus No. 24, *Hook. f. & Thoms. Herb. Ind. Or.*

Eastern temperate Himalaya; SIKKIM, alt. 7–10,000 ft., *Dr. Treutler.*

A large leafy erect bush, with often glandular bristles mixed with the soft flexuous hairs that cover all parts more or less; prickles passing into bristles, sometimes slightly decurved. *Leaves* 2–6 in. diam., membranous, green, with scattered hairs above; lobes shallow, rounded or acute, crenatures acute; petiole short or long and slender, sometimes 3 in.; stipules ½ in., almost orbicular in outline, concave, green. *Flowers* ¾–1 in. diam., shortly pedicelled; bracts sometimes reduced to narrow segments. *Calyx-tube* hemispheric, villous and often bristly; lobes large, often leafy and laciniate, or pectinately pinnatifid. *Petals* nearly orbicular, much smaller than the calyx, white or pink. *Stamens* very numerous. *Carpels* about 100, style very slender, stigma hairy.—This and *R. birmanicus* belong to the group with *R. Hookeri*, all having very numerous carpels and dry fruits.

SERIES II. Leaves digitately or pedately 3–5-foliolate.

* *Leaves glabrous or nearly so beneath.*

16. **R. fragarioides,** *Bertoloni Miscell.* xxii. 16, t. 5; herbaceous, unarmed, stem petioles and peduncles faintly pubescent, leaflets 3 or 5 obovate or orbicular with a cuneate base lobulate quite glabrous, lobules with acute sinus and coarse teeth, calyx-tube glabrous, lobes ovate-lanceolate quite entire.

Eastern Temperate Himalaya in swamps; SIKKIM, alt. 10–13,000 ft., *J. D. H., C. B. Clarke.*

A very small species; stem chiefly subterranean, slender, woody, sending up very short floriferous branches bearing one or two pedately 3–5-foliolate leaves. *Leaflets* membranous, contracted into the 1–3 in. very slender petiole; stipules ¼ in., broadly ovate, obtuse, toothed or quite entire. *Flowers* ¾ in. diam., white, peduncle ½–1 in. slender. *Calyx-tube* glabrous; lobes acuminate, tips slender. *Petals* obovate, acute. *Carpels* about 5, not seen ripe.—Very near to *R. triflorus,* Richards. β. *japonica* of Japan; see Maximovicz Diagnoses, Dec. x. 375.

17. **R. alpestris,** *Blume, Bijd.* 1108; erect, nearly glabrous, calyx and stipules eglandular, prickles small scattered, leaflets 3–5 elliptic narrowed at both ends acutely crenate-serrate, stipules linear-lanceolate, flowers 1–3 terminal on slender peduncles, calyx prickly, lobes caudate, carpels many glabrous. *Miquel, Fl. Ind. Bat.* i. part 1, 378. R. pentagonus, *Wall. Cat.* 731.

Temperate Himalayas; from GARWHAL, alt. 7–8000 ft., to SIKKIM, alt. 8–10,000 ft.—DISTRIB. Java.

A straggling shrub, with the young parts pubescent; stem stout, cylindric; prickles few, short, slightly curved. *Leaflets* 2–4 in., membranous, subsessile; terminal the largest, lateral often oblique; nerves 7–10 pair, slender, arched, sometimes faintly pubescent beneath; petiole 1–2 in., sometimes pubescent, usually armed; stipules small, membranous, usually glandular. *Flowers* ¾–1 in. diam., usually solitary, rarely 3-nate; peduncles armed or not, more or less pubescent and glandular. *Calyx* armed, rarely unarmed, densely pubescent or glabrate; lobes often ½ in. pubescent in the outer margins and within, suberect in fruit. *Petals* white, orbicular, shorter than the calyx. *Stamens* 1-seriate. *Fruit* globose; drupes 12–15, large, glabrous, stone rugose.

18. **R. Thomsoni,** *Focke Batogr. in Abhandl. Naturwiss. Verein, Bremen* iv. 198; prostrate, slender, eglandular, prickles few very small, leaflets 3 broad-ovate acuminate two lateral much the smallest crenate or serrate very

membranous, stipules filiform, flowers axillary solitary or in very short racemes or panicles, calyx unarmed, lobes acute or caudate, carpels many pubescent.

SIKKIM HIMALAYA, alt. 8–11,000 ft., *J. D. H.*, &c.

A slender trailing species, nearly glabrous or with pubescent branches petioles peduncles and nerves of the leaflets beneath, rarely above. *Leaflets* very membranous, terminal 2 in., often rhomboid-ovate, contracted at the base; lateral usually not half the size, petiolate; petiole slender, 1–2 in., with few prickles; stipules entire or divided. *Flowers* $\frac{1}{3}$–$\frac{1}{2}$ in. diam., peduncles and pedicels short. *Calyx-tube* nearly glabrous; lobes pubescent, sometimes produced and leafy, suberect in fruit. *Petals* small, orbicular, red. *Fruit* globose; drupes many, pale red, pubescent; stone minutely pitted.

** *Leaves silky beneath.*

19. **R. lineatus,** *Reinw. in Blume Bijd.* 1108; eglandular, prickles 0 or few small scattered, leaflets 3 or 5 elliptic oblong or lanceolate ciliate-serrate caudate-acuminate, beneath with many straight nerves and dense silky silvery tomentum, calyx-lobes ovate acuminate silky. *Miquel Fl. Ind. Bat.* i. *part* i. 378. R. pulcherrimus, *Hook. Ic. Pl.* t. 729–730.—Rubus *Sp.*, *Clarke in Journ. Linn. Soc.* xv. 141.

SIKKIM HIMALAYAS, alt. 6–9,000 ft.—DISTRIB. Java.

A strong suberect herb; branches softly pubescent, young silky; prickles when present straight. *Leaflets* 3 or 5, 4–5 by $\frac{1}{2}$–$2\frac{1}{2}$ in., subsessile, coriaceous, acuminate or cuneate at the base, often doubly-serrate, upper surface glabrous ribbed, under shining with 20–30 straight nerves on each side, one to every tooth; petiole 1–2 in., pubescent; stipules $\frac{3}{4}$–$\frac{1}{2}$ in., membranous, ovate-oblong, obtuse, entire, glabrate. *Flowers* in axillary short heads and terminal elongate silvery panicles, $\frac{2}{3}$–1 in. diam.; bracts large, concave, orbicular, membranous. *Petals* obovate, shorter than the calyx, white. *Drupes* numerous, small, red, stone rugose.—Very variable in the size of the flowers and breadth of the leaflets.

1315 VAR. 1. *angustifolia*; smaller, leaflets much narrower.

VAR. 2. *glabrior*; leaflets silky beneath on the nerves only. MISHMI, *Griffith.*

20. **R. Andersoni,** *Hook. f.*; glandular, unarmed, young shoots petioles and inflorescence hispid with spreading gland-tipped hairs, leaflets 3 or 5 elliptic or elliptic-oblong caudate-acuminate ciliate-serrate, beneath with many straight nerves and dense silvery silky tomentum, calyx-lobes triangular-lanceolate caudate. *Rubus Sp., Clarke in Journ. Linn. Soc.* xv. 141.

SIKKIM HIMALAYA, alt. 7–8000 ft., *J. D. H., Anderson.*

Very similar in foliage to broad-leaved states of *R. lineatus*, but at once distinguished by the almost setose purple gland-tipped spreading hairs, the long caudate-acuminate calyx-lobes which are also setose, and flowers in terminal broad panicles with long pedicels. It is a very rare plant; I gathered it near Darjeeling, as did Mr. C. B. Clarke, and on Sinchul. Dr. Anderson's specimens are stated to be from Punkabarri in a hot region, but I suspect some error.

SERIES III. Leaves pinnately 3-foliolate.

* *Stems slender creeping or prostrate.*

21. **R. saxatilis,** *Linn.*; *Boiss. Flor. Orient.* ii. 691; eglandular, glabrous or slightly pubescent, prickles few slender straight, leaflets 3 rhombic-ovate somewhat lobed acutely doubly-toothed, calyx unarmed, lobes ovate-lanceolate acute longer than the narrow petals, carpels few glabrous.

Western temperate Himalayas in the Tibetan region from KASHMIR to KUMAON, alt. 10–11,000 ft. WESTERN TIBET, Dras, alt. 10,000 ft.—DISTRIB. Caucasus and westward to the Atlantic, Siberia, Dahuria.

Stems annual from a stout woody rhizome, short, erect. *Leaflets* 2–3 in., membranous, the lateral subsessile with cuneate bases and often a lobed outer margin; petiole very slender, 3–5 in.; stipules linear or linear-oblong. *Flowers* ½ in. diam., 1–4, shortly pedicelled on the top of a slender axillary peduncle. *Calyx-tube* short, glabrous, unarmed; lobes lanceolate, erect in fruit. *Petals* white, small, slender. *Fruit* with few large scarlet drupes; stone reticulated.

22. **R. nutans,** *Wall. Cat.* 738; eglandular, unarmed, stem petioles peduncles and calyx-tube clothed with flexuous hairs or bristles, leaflets 3 orbicular or subrhomboidal obscurely lobed acutely doubly toothed, calyx-lobes large caudate-acuminate pinnatifid towards the tips, shorter than the obovate petals, carpels few glabrous. *Hook. Bot. Mag.* t. 523; *Edgworth in Trans. Linn. Soc.* xx. 45.

Temperate Himalayas, from GARWHAL and KUMAON, alt. 8–10,000 ft.

Stems as thick as a sparrow quill, 1–2 ft. long from a woody rootstock; hairs rather stiff, red-brown when dry. *Leaflets* 1½–3 in. long and broad, membranous, glabrous and dark-green above, hairy along the nerves beneath, base cuneate, lateral shortly petiolulate; petiole 2–4 in.; stipules large, broadly ovate or oblong, entire or toothed. *Flowers* usually solitary, axillary, 1½ in. diam.; peduncle stout. *Calyx-tube* villous, lobes ¾–½ in. *Fruit* of few scarlet drupes; stone smooth.

VAR. *nepalensis*; more slender, smaller in all its parts, leaflets ½–1½ in., flowers ½–¾ in. diam., calyx lobes acuminate, not quite entire.—East Nepal, Tambur River, alt. 9000 ft., *J. D. H.*

23. **R. Fockeanus,** *Kurz in Journ. As. Soc. Beng.* 1875, ii. 206; eglandular, unarmed, stem petioles and peduncles pubescent, leaflets orbicular finely toothed, nearly glabrous on both surfaces, flowers solitary, calyx-tube glabrous or sparsely setose, lobes ovate-lanceolate quite entire.

Eastern temperate Himalaya; SIKKIM on the Lachoong River and Phullalong and Singalelah, alt. 10–14,000 ft. *J. D. H., C. B. Clarke.*

Stems wholly procumbent, widely creeping, slender, very sparingly pubescent. *Leaflets* ¾–1 in. diam., not shining above, and with very few hairs on the nerves beneath, lateral petiolulate; petiole 1 in.; stipules ¼ in., oblong, obtuse, toothed or quite entire. *Flowers* on very short lateral shoots; peduncle exceeding the petiole. *Calyx* ½ in. across the lobes, tube almost glabrous, lobes acuminate. *Petals* not seen. *Fruit* a few red drupes; stone quite smooth.—The small size, absence of long hairs, opaque foliage and smooth stone of the drupes distinguish this at once from *R. nutans.*

24. **R. Hookeri,** *Focke Batogr. in Abhandl. Naturwiss. Verein Bremen,* iv. 197 (1874); stem petioles and inflorescence pubescent with copious soft hairs and glandular bristles, prickles few straight, leaflets 3 large rhomboid-ovate or -orbicular caudate-acuminate lobulate and toothed, stipules pectinate, flowers large solitary and in few-flowered axillary panicles, calyx hispid, lobes with filiform points, carpels very numerous. R. macrocarpus, *Kurz MSS., Clarke in Journ. Linn. Soc.* xv. 141.

Eastern temperate Himalaya; SIKKIM, alt. 7–9000 ft.

A low shrub, almost hispid with gland-tipped hairs, prickles slender. *Leaflets* petiolulate, often subequal, 2–5 in., bright green, bases acute or rounded, upper surface glabrous with pubescent nerves, under also glabrous with hairy nerves; petiole 2–3 in.; stipules orbicular or broadly oblong, foliaceous, recurved, villous. *Flowers* 1½–2 in. diam., with often persistent foliaceous pectinate bracts. *Calyx* pubescent, bristly, lobes 1 in., triangular-ovate, often laciniate, spreading in fruit. *Petals* much smaller than the calyx, orbicular, greenish-white. *Stamens* very numerous. *Carpels* in a dense cluster of 2–300 or more, and base of long filiform conniving styles, vil-

lous. *Fruit* globose, ¾ in. diam.; outer carpels dry, glabrous below villous above, imbricating over the inner succulent carpels; endocarp pitted; receptacle broad, hemispherical, velvety, intruded at the base.

** *Stems erect sarmentose or climbing.*

25. **R. niveus,** *Wall. Cat.* 734; eglandular, bristles 0, branches and petioles glabrous or tomentose, prickles recurved, leaflets 3 (rarely 5) coarsely or finely double-toothed lateral obliquely ovate acuminate terminal elliptic ovate or rounded lobulate or lobed, glabrous above, usually white with dense pubescence beneath, stipules filiform, flowers in lateral and terminal few-flowered tomentose corymbs, calyx-lobes acuminate or caudate, petals small obovate pink, carpels many villous. R. gracilis, *Roxb. Cat. Hort. Beng.* 39; *Fl. Ind.* ii. 519.

Temperate Himalaya, from KASHMIR to BHOTAN, at elevation of 6–10,000 ft. in the west and 5–11,500 ft. in the east.

A large rambling bush, without bristles or gland-tipped hairs; very variable in all its parts. *Stem* stout and branches often purple, young often quite glabrous and glaucous or thickly or thinly tomentose; prickles short, scattered, pale. *Leaflets* 1–5 in., entire or lobulate, toothed or crenate, acute acuminate or caudate, terminal sometimes cordate, usually membranous and glabrous, above sometimes (*R. concolor*) green and glabrous beneath also; petiole slender, 1–2 in., with usually 1–2 prickles. *Flowers* ¼–1 in. diam., usually on slender unarmed pedicels, lower axillary often solitary, upper corymbosely arranged on a long peduncle, nodding; bracts filiform. *Calyx-tube* short, flat; lobes ovate-lanceolate, quite entire, ¼–½ in., tomentose on both surfaces, spreading or reflexed in fruit. *Petals* much smaller than the calyx-lobes. *Stamens* very numerous. *Fruit* globose, large or small, of few or many dry or fleshy drupes; stone pitted.—Closely allied to *R. lasiocarpus.* I find it impossible to arrange satisfactorily the forms of this most puzzling plant; the following are noticeable.

VAR. *niveus* proper (*Wall. Cat.* 734), softly pubescent, leaflets 2–3 in. membranous ovate-lanceolate caudate-acuminate lobulate and very acutely deeply toothed, corymbs of 10–12 shorly pedicelled flowers ⅓ in. diam.—Nepal and all along the Himalaya.

VAR. *pedunculosus*; more robust, leaflets 3–5 in. broader bases more rounded, flowers solitary or in pairs on slender pedicels ⅔ in. diam., R. pedunculosus, *Don Prodr.* 234; *Wall. Cat.* 729.—Nepal, Sikkim.

VAR. *racemosus*; softly tomentose, flowers in short terminal racemes shortly pedicelled suberect. Kashmir, *Jacquemont, Falconer.* Murree, *Fleming* ("fruit large yellow brown"). Kashmir, *Clarke* (fruit bright red) who also has a densely cottony subvar. with abbreviated racemes (Kashmir, 8000 ft.). This resembles what a hybrid with *corylifolius* might be,

VAR. *hypargyrus*; leaflets ½–1 in., sometimes 5, doubly serrately-toothed membranous hoary beneath all over or on the nerves only, or quite glabrous. R. hypargyrus, *Edgw. in Trans. Linn. Soc.* xx. 45. R. concolor, *Royle MSS.* Approaches *R. lasiocarpus.*

VAR. *Aitchisoni*; slender, finely tomentose, leaflets broad membranous with very large crenatures, fruit ¾ in. diam. of very numerous orange fleshy almost glabrous drupes. Kashmir common at 7000 ft., *Aitchison* "fruit eatable."

VAR. *microcarpa*; branches and petiole (6 in.) nearly glabrous, leaflets 4–6 in. broad membranous lobulate and crenate, flowers ½ in., fruit very small of 30–40 quite glabrous dry drupes.—Sikkim, Lachen, alt. 9000 ft., *J. D. H.*

VAR. *concolor*; leaflets as variable as any of above forms, usually membranous glabrous or nearly so beneath acutely inciso-serrate or toothed or coarsely crenate, flowers corymbose, sepals ¼–1 in. R. concolor, *Wall. Cat.* 733.—From Kashmir to Kumaon. This passes into var. *hypargyrus.*

VAR. *Falconeri*; similar to var. *concolor* but carpels quite glabrous!—N. W. India, *Falconer.* On the Kishengunga west from Kashmir, *Stewart.*—This connects *R. niveus* with *R. cæsius*, L.

According to priority, Roxburgh's name of *S. gracilis* should be retained for this

plant, but I am disinclined to replace so excellent, well known and suggestive a one as *niveus* for another that is in no way distinctive of the species.

26. **R. macilentus,** *Camb. in Jacquem. Voy. Bot.* 49, t. 60; nearly glabrous, eglandular, prickles stout flattened straight or hooked, leaflets 3 ovate or ovate-lanceolate obtuse acute or acuminate doubly-crenate-toothed, stipules setaceous, peduncles axillary and subterminal 1–3-flowered, carpels many glabrous. R. uncatus, *Wall. Cat.* 750. R. asper, *Hb. Royle.*

Temperate Himalaya; from HAZARA, alt. 4–6000 ft., *Stewart*, and KISHTWAR, alt. 5–9000 ft. to SIKKIM and BHOTAN, alt. 6–9000 ft.

Stems trailing, stout, red-brown, obtusely angled, shining; prickles much flattened, $\frac{1}{6}$–$\frac{1}{4}$ in. *Leaflets* $\frac{1}{2}$–2 in., rigidly coriaceous, brown when dry, glabrous on both surfaces, terminal usually ovate-lanceolate long-acuminate, lateral sessile, smaller, sometimes orbicular; midrib beneath with hooked prickles; petiole stiff, sometimes pubescent along the grooved upper surface. *Flowers* $\frac{1}{3}$ in. diam.; peduncles $\frac{1}{4}$–$\frac{3}{4}$ in., pubescent, rarely 2–3-flowered. *Calyx* silky outside, tomentose within; lobes caudate, erect in fruit. *Petals* orbicular-obovate, clawed, exceeding the sepals, white. *Fruit* globose, enclosed in the calyx; drupes 20–30, yellow or red, glabrous, seated on a columnar pubescent receptacle; stone rugged.

27. **R. sikkimensis,** *Hook. f.*; glandular-hairy and covered with long straight prickles, leaflets 3 ovate acuminate lobulate and coarsely crenate glandular above nearly glabrous beneath, stipules linear, peduncles axillary 1–2-flowered, calyx glandular and hispid, lobes caudate, carpels numerous glabrous.

Subalpine SIKKIM HIMALAYA; Lachen, alt. 12–13,000 ft., *J. D. H.*

A small shrub, dark brown when dry; stems stout; gland-tipped hairs long spreading, half as long as the quite-straight shining prickles. *Leaflets* 1–2 in., terminal, sometimes deltoid-ovate, base rounded or subcordate, lateral subsessile, smaller, narrower; petiole 1–3 in., very slender, pubescent; stipules $\frac{1}{3}$ in. *Peduncles* $\frac{1}{4}$–1 in., pubescent glandular and bristly as is the calyx. *Flowers* $\frac{3}{4}$ in. diam., inclined. *Calyx-lobes* lanceolate, pubescent on both surfaces. *Petals* red-purple.—This in many respects resembles *R. pungens*, Camb., and *R. horridulus*, H. f.

28. **R. ellipticus,** *Smith in Rees Cyclop.* xxx, *Rubus* 16; shaggy with spreading flexuous hairs, prickles scattered stout hooked, leaflets 3 orbicular obovate or elliptic obtuse or abruptly acute toothed pale and pubescent beneath, panicles axillary and terminal dense-flowered, calyx-lobes mucronate or acuminate, carpels silky. *DC. Prodr.* ii. 563; *Wall. Cat.* 740 *in part.* R. rotundifolius, *Wall. Cat.* 730. R. Gowry-phul, *Roxb. Hort. Beng.* 39. R. Gowreephul, *Roxb. Fl. Ind.* ii. 517; *W. & A. Prodr.* 298; *Wight Ic.* t. 230. R. flavus, *Ham. in Don, Prodr.* 234; *Brand. For. Flor.* 197; *Kurz, For. Flor. Brit. Burm.* i. 438. R. sessilifolius, *Miq. Pl. Ind. Or. Hohenack,* 438*a*, 1153. ? R. paniculatus, *Moon. Cat. Ceyl. Pl.*

Temperate and subtropical Himalaya, from SIRMUR, alt. 2–7000 ft. to SIKKIM, alt. 4–7000 ft. and BHOTAN. KHASIA MTS., alt. 4–5000 ft. BIRMA. Western Ghats from CANARA southwards. CEYLON, central province, alt. 4–7000 ft.—DISTRIB. Yunan.

A tall suberect bush; branches stout, spreading and recurved, obscurely angled; hairs red-brown, often very dense, covering a softer down with occasional glandular hairs; prickles stout, hardly compressed. *Leaflets* 2–4 in., coriaceous, dark green above, rarely glabrous beneath; petiole 1–3 in.; stipules subulate. *Panicles* small, many-flowered, pedicels short; bracts setaceous. *Flowers* $\frac{1}{3}$–$\frac{1}{2}$ in. diam. *Calyx* densely pubescent and bristly or not; lobes ovate, acute acuminate or obtuse and mucronate, erect in fruit. *Petals* obovate, larger than the calyx, white. *Stamens* 1-seriate. *Fruit* globose, exposed; drupes on a cylindric hairy receptacle, many, golden yellow, succulent; stone rugose.

VAR. *hirta*; leaflets green beneath. R. hirtus, *Roxb. Hort. Beng.* 38; *Fl. Ind.* ii.

518; R. Wallichianus, *Wt. & Arn. Prodr.* 298; *Dalz. & Gibs. Bomb. Flor.* 89; R. ellipticus, *in part Wall. Cat.* 740; R. affinis, *Madden MSS.*—Himalaya and Western Ghats.

VAR. *denudata*; shaggy hairs absent or very rare. R. rotundifolius, *Wall. Cat.* 730 in part.—Kumaon, Bhotan.

29. **R. fruticosus,** *Linn.*; *DC. Prodr.* ii. 560; *var.* DISCOLOR; eglandular, branches robust and leaves beneath hoary with white stellate tomentum, prickles short scattered hooked, leaflets orbicular obovate or elliptic obtuse or acute, stipules setaceous, flowers in dense thyrsoid terminal panicles, calyx-lobes short acute reflexed in fruit, carpels quite glabrous. R. discolor, *Weihe & Nees*; *Boiss. Fl. Orient.* ii. 695.

Western temperate Himalaya, alt. 3–7000 ft. from MURREE to JAMU.—DISTRIB. Afghanistan and westward to the Atlantic.

Stems arched, obtusely angled, channelled; prickles stout. *Leaflets* sometimes 5 at the base of the stem, 1–2 in., coriaceous, sometimes abruptly acuminate; petiole ½–1 in., flattened above; stipules subulate, velvety. *Panicles* 6–10 in.; branches short, very stout, densely tomentose; pedicels stout, short; bracts often toothed or laciniate. *Flowers* ⅔–¾ in. diam. *Calyx-tube* short, lobes woolly on both surfaces, sharply reflexed in fruit. *Petals* obovate, pink. *Stamens* very numerous, in many series. *Fruit* small, globose; drupes many, fleshy, black; receptacle deciduous; stone pitted.

30. **R. Clarkei,** *Hook. f.*; herbaceous?, eglandular, branches petioles and peduncles very slender faintly pubescent and with copious slender acicular straight prickles, leaflets 3 orbicular obtuse and coarsely doubly crenate laxly pubescent beneath, stipules oblong green, peduncles 1–3-flowered axillary, calyx-lobes lanceolate.

KASHMIR, at Sonamung, alt. 9250 ft., *C. B. Clarke.*

A very slender small perhaps herbaceous species; branches probably armed, soft, green, laxly clothed with spreading hairs; prickles numerous, very slender, quite straight, not extending to the midribs. *Leaflets* 2–3 in. long, nearly as broad, dark green, rounded or cuneate at the base, petiolulate; petiole 1–3 in., slender; stipules persistent, obtuse or acute, entire or serrate, pubescent. *Flowers* drooping, ½ in. diam., solitary in the lower axils, corymbose in the upper; bracts green, small, oblong, acute. *Calyx*-tube not bristly, densely pubescent; lobes narrow-lanceolate. *Fruit* of few glabrous drupes; stone pitted.—Of this very distinct species I have seen no flowers.

31. **R. antennifer,** *Hook. f.*; eglandular, branches petioles and peduncles laxly pubescent and with copious slender straight acicular prickles, leaflets 3 orbicular-ovate acuminate lobulate and acutely doubly toothed, faintly pubescent beneath, stipules linear-lanceolate acuminate, corymbs axillary and terminal, calyx-lobes ovate with long slender tips, carpels very many glabrous.

KASHMIR; Sonamurg, alt. 8500 ft., *C. B. Clarke.*

A much stouter plant than *R. Clarkei*, similarly clothed with slender straight prickles and soft hairs, but the leaflets are more coriaceous, very acutely toothed, the lateral sessile, the terminal cordate, and the inflorescence and flowers are quite different. *Stipules* ⅓–½ in., green, persistent, quite entire. *Peduncles* often 2–3 in., stiff, erect, the terminal continuing the branch and bearing a branched corymb; pedicels often long and slender; bracts filiform. *Flowers* erect, ¾–1 in. across the sepals. *Calyx* not or hardly bristly, tomentose; lobes pubescent on both surfaces ovate, suddenly contracted into filiform tips often as long as themselves. *Petals* orbicular-obovate, white, about equalling the limb of the calyx. *Carpels* on a columnar pubescent receptacle.

32. **R. purpureus,** *Bunge Enum. Plant. Chin. Bor.* 24; glandular, branches petioles inflorescence and calyxes densely covered with small deflexed

prickles, leaflets 3 (rarely 5) broad-ovate coarsely acutely doubly crenate white beneath, cymes axillary few-flowered, flowers drooping, carpels pubescent.

Western temperate Himalaya, KUNAWUR, in the Tibetan region, alt. 11–14,000 ft., *T. Thomson*.—DISTRIB. N. China.

Branches stout, shining, pale or dark yellowish; purple glandular hairs few, scattered; prickles short, flattened, straighter on the petioles and inflorescence. *Leaflets* 2–4 in., glabrous above, terminal broad-ovate or orbicular, cordate; lateral sessile, smaller; petiole 1–3 in., stout, pale, coloured like the stem; stipules setaceous, glandular. *Flowers* ½ in. diam., solitary in the lower axils, 2–4 in peduncled cymes in the upper. *Calyx* pubescent and bristly; lobes ovate-lanceolate, finely acuminate, erect in fruit. *Petals* smaller than the calyx, orbicular-oblong, *Fruit* enclosed in the calyx, globose, red, of many (about 20) tomentose drupes situated on a columnar pubescent receptacle; endocarp pitted. Very near *R. colchicus*, Herb. Stev., from the Caucasus, if not a few-flowered variety of that plant. Jaeschke sends 5-foliolate leaves of apparently this species from Lahul.

VAR. *subinermis*, more slender and lax with the prickles reduced almost to bristles. —Kishtwar, *Thomson*; Kashmir, *Falconer*, alt. 9250 ft., *C. B. Clarke*; common in water channels at 8–10,000 ft., *Aitchieson*.—Clearly a lax state of the Tibetan drier climate prickly plant.

33. **R. lucens,** *Focke Batogr. in Abhandl. Naturwiss. Verein, Bremen.* iv. 199 (1874); eglandular, almost glabrous, prickles scattered short hooked, leaflets 3 ovate elliptic orbicular or ovate-lanceolate caudate-acuminate serrate shining above, stipules linear, racemes axillary and terminal long slender, carpels few hirsute. R. lævigatus, *Wall. Cat.* 1280.

KHASIA MTS., alt. 3–4000 ft., *Simons*, &c.; ASSAM, *Jenkins*; MISHMI HILLS, *Griffith*.

Stem very stout, climbing lofty trees; branches angled, grooved, quite smooth; prickles very short. *Leaflets* 4–5 in., brown when dry, coriaceous, serratures simple, acute, petiolules short and nerves beneath puberulous; petiole 2–6 in., prickles many or few; stipules almost setaceous. *Panicles* 6–12 in., lower sometimes crowded in the leaf-axils; terminal slender, pubescent; bracts subulate. *Flowers* small, ⅓ in. diam., in fascicles or short corymbs; pedicels slender. *Calyx* densely hoary; tube very short; lobes oblong, obtuse or apiculate, erect in fruit. *Petals* equalling the sepals, pink or white, obovate, clawed. *Stamens* 20–30, in one series. *Fruit* enclosed in the calyx; drupes 6–8, sweet; stone rugose; receptacle low, pubescent.

SECT. IV. Shrubs. Leaves pinnately 5–7-foliolate, upper (or all in 37. *foliolosus*) sometimes 3-foliolate.

34. **R. biflorus,** *Ham.*; *Smith in Rees Cyclop.* xxx. *Rubus* 9; eglandular, prickles strong hooked, leaflets 3 or 5 ovate lobulate doubly toothed white and tomentose beneath, stipules linear-lanceolate, flowers 1–3 together on axillary slender peduncles drooping, calyx-lobes broad-ovate acuminate, carpels numerous woolly above. *Wall. Cat.* 735; *DC. Prodr.* ii. 558; *Bot. Mag.* t. 4678.

Temperate Himalaya; from SIRMORE, alt. 7–9000 ft., to SIKKIM, alt. 8000 ft., and BHOTAN.

A strong rambling shrub; stems and branches quite glabrous, white with glaucous bloom; prickles very strong and much recurved. *Leaves* chiefly on short lateral branches; upper sometimes 1-foliolate and 3-lobed; leaflets 1–1½ in., rarely more, acutely toothed or serrate, pubescent or hairy above, densely tomentose beneath; petiole slender, 1–2 in., prickly, pubescent; stipules ¼ in. *Peduncles* ½–1½ in., unarmed or prickly, usually glabrous; bracts subulate. *Flowers* ½–¾ in. diam. *Calyx* pubescent on both surfaces or glabrate outside; lobes broad, suberect or spreading in fruit. *Petals* equalling or exceeding the calyx, orbicular, white. *Stamens* numerous. *Fruit* globose, ¾ in. diam.; drupes 20–30 golden yellow, succulent; stone reticulated with pits; receptacle columnar, villous.

35. **R. lasiocarpus,** *Smith in Rees Cyclop.* xxx. *Rubus* 6; eglandular, prickles scattered stout straight or hooked, branches glabrous very glaucous, leaflets 5–9 ovate elliptic or ovate-lanceolate acutely toothed or serrate, beneath ribbed and usually hoary with white tomentum, terminal alone lobulate, stipules subulate, corymbs small axillary and terminal tomentose, petals small red, carpels many tomentose. *DC. Prodr.* ii. 558. *Wight. & Arn. Prodr.* 299; *Wight. Ic.* t. 232; *Grah. Cat. Bomb. Pl.* 64; *Dalz. & Gibs. Bomb. Flor.* 89; *Kurz For. Flor. Brit. Burm.* i. 439. R. distans, *Don Prodr.* 256 (pinnatus 234). R. Horsfieldii, *Miq. Fl. Ind. Bat.* i. part 1, 375. R. albescens, *Roxb. Hort. Beng.* 39; *Flor. Ind.* ii. 519. R. rosæflorus, *Roxb. Fl. Ind.* ii. 519. R. rotundifolius, *Royle Ill.* 203 (name only). R. mysorensis, *Heyne in Roth Nov. Gen. & Sp.* 235. R. indicus, *Heyne MSS.* ? R. parvifolius, *Moon Cat. Ceyl. Pl.* R. furfuraceus, *Wall. Cat.* 739. R. bijugus, *Focke Batogr. in Abhandl. Naturwiss. Verein, Bremen.* iv. 200 (1874).

Temperate Himalaya, from MURREE and KASHMIR, alt. 5–8000 ft. (ascending to 1500 ft. in Kumaon), to SIKKIM, alt. 4–10,000 ft. BURMA. WESTERN PENINSULA on the higher Ghats from Canara southwards. CEYLON, central province, alt. 4–7000 ft.—DISTRIB. Java.

A large rambling very variable plant; branches cylindric, with coloured pruinose bark, the very young only tomentose; prickles compressed, variable in size and curvature, extending to the petioles and rachis, but not or rarely to the inflorescence. *Leaves* 3–10 in.; leaflets 1–3 in., rather coriaceous, opaque, glabrous or silky above, almost plaited by the strong straight nerves, which are very prominent beneath, sometimes very acute, often doubly toothed and mucronate, terminal usually broad-ovate. or even orbicular, rounded acute or cordate at the base; lateral sessile, rarely ovate or orbicular; petiole stout, grooved above, glabrous and shining or tomentose; stipules ¼ in., linear-subulate. *Corymbs* axillary and terminal, simple or subpanicled, densely tomentose or villous, or merely puberulous, on short or long (1–2 in.) peduncles, 2- many-flowered; pedicels long or short; bracts setaceous or filiform. *Flowers* ⅓–⅔ in. diam *Calyx* densely woolly; tube small; lobes ovate or ovate-lanceolate, acute acuminate or caudate, spreading or suberect in fruit; laciniate and much lengthened in Moulmayne specimens. *Petals* deep pink, orbicular or broadly obovate, rarely exceeding the calyx. *Fruit* ¼–½ in. diam., globose, hoary; drupes numerous, dry, or fleshy and then red or orange; stone pitted; receptacle columnar, villous.

It is as difficult to define the varieties of this *Rubus* as it is those of *R. niveus*, to which they are in a degree analogous, and it is also difficult to separate the three following species from it by constant definable characters.

VAR. *furfuraceus*; a large form, leaflets narrow 1–2½ in. grey with very fine down beneath, corymbs paniculate, terminal large much branched. R. furfuraceus, *Wall. Cat.* 739, Ava.

VAR. *pauciflorus*, a large very common Himalayan form, glabrous and shining except the white undersurface of the leaves, with corymbs of many crowded small puberulous flowers. R. pauciflorus, *Wall. Cat.* 727; *Lindl. in Bot. Reg.* t. 854. R. longifolius, *Wall. MSS.* R. Ischelus, *Herb. Ham.* R. distans, *Don Prodr.* 256 (pinnatus, 234).

VAR. *micranthus*; much smaller in all its parts, leaves almost glaucous beneath. R. micranthus, *Don Prodr.* 235. Nipal, *Wallich.*

VAR. *sericeus*; leaflets 2–3 in. coarsely serrate pale green membranous beautifully silky on both surfaces paler but not white beneath, corymbs many-flowered, sepals lanceolate. Kishtwar, *Thomson.*

VAR. *membranaceus*; leaflets 2–3 in. coarsely crenate-toothed very membranous perfectly glabrous above faintly downy beneath, corymb terminal compound. Kumaon, *Strach. & Winterb.* (18). Sikkim, J. D. H.

VAR. *rosæfolius*; quite glabrous except the branches of the corymbs and margins of sepals, leaflets 1–1½ in. inciso-serrate membranous, dark brown when dry, flowers small in axillary corymbs, sepals with filiform points.—Sikkim, alt. 9–10,000 ft., *J. D. H.*

VAR. *subglaber,* Thwaites Enum. 101; leaflets 1–1½ in. rounded, finely crenate-

serrate faintly pubescent on the nerves beneath; dark brown when dry, midrib beneath often prickly. Ceylon.—Kurz (*Journ. As. Soc. Beng.* 1876, pt. ii. 307) refers Roxburgh's *R. rosæflorus* to *R. rosæfolius*, Sm., but a reference to Hardwick's description cited by Roxburgh proves that this cannot be correct.

36. **R. racemosus,** *Roxb. Fl. Ind.* ii. 519; branchlets petioles and inflorescence clothed with glandular hairs, prickles straight or hooked, leaflets 5–7 ovate or orbicular-ovate acutely toothed, beneath usually densely white-tomentose, stipules lanceolate, corymbs axillary and terminal, calyx prickly, petals large red, carpels many villous. R. lasiocarpus, *Sm., Var.? Miq. Pl. Exsicc. Hohenack.* No. 1152.

NILGHIRI MTS., *Adam, Gardner*, &c. PULNEY MTS., *Wight*.

I cannot doubt this being an extreme form of *R. lasiocarpus*, readily distinguishable by the copious glandular bristles and hairs, the usually densely tomentose branches, corymbs, petioles, &c., and the prickly calyx and large petals; the leaflets too are usually broader, very coriaceous, glabrous above or with sometimes copious almost woolly hairs. In Hohenacker's specimens however the branchlets and petioles are nearly glabrous, and in all the branches are beautifully pruinose. The sepals are caudate and quite entire. Wight's Pulney mountain specimens have the leaflets more membranous, almost glabrous beneath except along the nerves, like var. *subglaber* of *R. lasiocarpa*. I have seen no authentic specimen of Roxburgh's plant (which Kurz (Andaman Report) refers to *lasiocarpus*) and refer the above to it as the only Peninsular species according with his description.

37. **R. foliolosus,** *Don Prodr.* 256 (*microphyllus*, p. 234); eglandular, branches petioles and inflorescence villous or densely tomentose, prickles straight or hooked, leaflets 3–7 small ovate or almost orbicular coarsely crenate-toothed or serrate white-tomentose beneath, flowers small in axillary branched long peduncled corymbs, petals small red, carpels villous.—R. Roylei, *Klotzsch in Reise Pr. Waldem. Bot.* 154, t. 6. R. parvifolius, *Smith in Rees Cyclop.* xxx. *Rubus* 21, *not of Linn.*; *Wall. Cat.* 736.

Central and Western temperate Himalayas. NIPAL, *Wallich*; CHAMBA to KUMAON, alt. 5–8000 ft., *Thomson*, &c.

Except by its usually prostrate habit and much smaller size, I do not think that this is distinguishable from *R. lasiocarpus*. In Wallich's specimens the leaflets are ½ in. long, lateral orbicular cuneate, terminal lobed, are very pubescent above and white beneath, but in Thomson's and others they become more ovate glabrous above and almost silky beneath or even glabrous except along the nerves as in varieties of *lasiocarpus*. The flowers are numerous, about ⅓ in. diam., with pink petals equalling the calyx-lobes; and the fruit is very small, white and villous. Don, misled by a specimen of *R. biflorus* sent under the same name by Wallich (and fastened on the same sheet in Herb. Linn. Soc.), describes the peduncles as 3-flowered. Maximowicz Diagn. x. 392, is certainly wrong in referring this to the *R. parvifolius*, Linn.

38. **R. opulifolius,** *Bertol. Misc. Bot.* xxii. 16, t. 4; inflorescence glandular-hairy and as well as the stout branches and petioles densely softly tomentose, prickles few straight or hooked, leaflets 3–5 acute or acuminate crenate-toothed coriaceous densely clothed beneath with white wool, lateral elliptic terminal broader lobed, flowers in axillary and terminal subsessile abbreviated racemes, calyx with glandular bristles, petals small red, carpels many silky.

KHASIA MT., at Moflong, alt. 5500 ft., *Griffith*; *J. D. H. & T. T.* Upper Kala Pani, alt. 4000 ft., *C. B. Clarke*.

A much more robust plant than *R. lasiocarpus*, with dense soft tomentum on the young and even on last year's branches, the older of which are however glaucous and pruinose (as in all these red-flowered species); prickles when straight large and much flattened. *Leaflets* 1½–2½ in., softly downy or glabrous above, very white

beneath except the nerves which have a yellowish pubescence; petiole stout, prickly or not; *stipules* setaceous, quite entire. *Flowers* much crowded, ¾ in. diam.; bracts setaceous, very tomentose. *Calyx* densely tomentose and bristly; lobes lanceolate, acuminate, quite entire. *Petals* obovate-oblong. *Carpels* with long silky hairs, not tomentose as in the ordinary forms of *R. lasiocarpus*. *Fruit* globose, of many fleshy orange-red almost glabrous drupes; stone deeply pitted.—This is possibly another extreme form of *R. lasiocarpus*, which (like *R. racemosus*) has become glandular.

39. **R. horridulus,** *Hook. f.*; eglandular, prickles very many crowded hooked, branches arched, leaflets 5–7 densely softly hairy incised-serrate, petioles and single-flowered peduncles densely clothed with hooked prickles, calyx-tube hemispheric densely clothed with straight prickles, petals purple, carpels villous.

Bhotan, at Panga, alt. 7600 ft., *Griffith.*

Branches cylindric, slender, glabrous, with usually straight slightly compressed prickles. *Leaves* 2–4 in.; petiole very slender, sparingly hairy, with numerous strongly hooked prickles; leaflets ⅓–½ in., equally clothed with long soft flexuous hairs on both surfaces, acute or acuminate. *Peduncle* clothed and armed like the petioles, 1 in., always 1-flowered. *Calyx-tube* ¼ in. diam., quite clothed with spreading straight shining prickles; lobes large, ovate-lanceolate, long-acuminate, quite entire, pubescent on both surfaces, erect in fruit. *Petals* small, purple according to Griffith's notes. *Stamens* very numerous. *Carpels* numerous, villous, with long straight white hairs. *Fruit* small, of 6–12 subpubescent drupes; stone reniform, rugosely pitted.—This appears to be in every way a very distinct species, but it is impossible to say to what extent more copious materials may modify the above description; it is allied to *R. sikkimensis*, H. f., and *pungens*, Camb.

40. **R. pungens,** *Camb. in Jacq. Voy. Bot.* 48, t. 59; eglandular except sometimes the inflorescence and petioles, prickles many slender straight, stems very long and slender, leaflets 5–7 membranous ovate deeply inciso-serrate glabrous concolorous, flowers solitary or 2–3 axillary long-peduncled, calyx densely prickly, lobes caudate, carpels with long hairs. *Maximov. Diagn.* x. 386.

Kashmir, *Falconer, Jacquemont*; Shapinga, alt. 7000 ft., *C. B. Clarke*; woods at Gulmuz at 8600 ft., *Aitchieson*. Khagan, 100 miles N.W. of Kashmir, alt. 8000 ft., *Stewart*.—Distrib. Japan (a variety).

Branches long, lax, cylindric, trailing, green, glabrous except the pubescent tips. *Leaves* 2–4 in., petiole very slender, sometimes glandular, unarmed or with faintly hooked prickles; leaflets 1–1½ in., sessile, bright-green on both surfaces, quite glabrous or faintly hairy on the nerves beneath, terminal broader, cordate, 3-lobed; stipules narrow lanceolate or setaceous. *Flowers* nearly 1 in. diam., erect; peduncle stout, slender, prickly and pubescent. *Calyx-tube* hemispheric; lobes sometimes ⅔ in. long, pubescent on both surfaces, spreading in fruit. *Petals* obovate-spathulate, longer than the calyx, white (?). *Fruit* globose, small; drupes few, on a conical glabrous receptacle, pubescent, stone minutely pitted.—Clearly closely allied to *R. horridulus* and *sikkimensis*, but with more the habit of *R. idæus* or *saxatilis*. The petals are multiplied in Falconer's specimen.

41. **R. rosæfolius,** *Smith Ic. ined.* iii. t. 60; glabrous or pubescent, glandular-hairy or not, prickles scattered hooked, leaves long, leaflets 5–7 ovate-lanceolate acuminate doubly inciso-serrate, green on both surfaces, stipules subulate-lanceolate, flowers solitary and in very loose panicles, calyx-lobes caudate, petals white exceeding the calyx, carpels excessively numerous, fruit large of innumerable orange-red minute glabrous drupes. *Roxb. Fl. Ind.* ii. 518; *Wall. Cat.* 728; *Kurz For. Flor. Brit. Burm.* i. 439; *Hook. Ic. Pl.* t. 349. R. pinnatus, *Willd.* R. asper, *Don Prodr.* 234; *Wall. Cat.* 741. O. sikkim-

ensis, *Otto Kunze MSS. in Herb. Clarke?* R. paniculatus, *Clarke in Journ. Linn. Soc.* xv. 140, *not of Smith.*

Temperate Himalayas; from KUMAON, alt. 7000 ft., to SIKKIM, alt. 4–7000 ft., *J. D. H.* KHASIA MTS., alt. 3–4000 ft. AVA and MARTABAN Hills, *Kurz.*—DISTRIB. Java. Naturalised and cultivated in the tropics and warm temperate regions; flowers often double.

Stems erect or inclined; branches slender, glabrous, pubescent or almost villous, as are the petioles and peduncles, sometimes crinite with long dark-brown spreading simple or gland-tipped hairs (*R. sorbifolius*, Maxim.); prickles sometimes very numerous, mostly straight on the stem and hooked on the petiole leaflets and inflorescences. *Leaves* 2–5 in. long, bright green, never glaucous or white beneath; petiole slender, often prickly; leaflets 1–2 in., rarely more, membranous or coriaceous, sessile or petiolulate; stipules linear-lanceolate or filiform, long-acuminate. *Flowers* $\frac{3}{4}$–1 in. diam.; peduncles usually slender, prickly. *Calyx* glabrous or pubescent, not prickly, tube small; lobes acute or acuminate or hair-pointed, or drawn out to a serrated limb nearly an inch long; spreading in fruit. *Petals* orbicular-obovate. *Carpels* excessively numerous, glabrous, on a villous receptacle. *Fruit* globose or more often oblong; drupes smaller than in any other species; stone deeply pitted.—R. paniculatus, *Roxb.* (R. Roxburghianus, *Wall. Cat.* 732.) from the Moluccas is *R. parvifolius*, Linn. & Rumph. (Amboin. v. t. xlvii.), and perhaps also *R. fraxinifolius*, Poir.; it has larger leaves and smaller calyx and fruit than *rosæfolius. R. Javanicus, Celebicus* and others are in various respects intermediate, and all may prove forms of one common Malayan plant.

DOUBTFUL SPECIES.

R. HIBISCIFOLIUS, *Focke Batogr. in Abhandl. Naturwiss. Verein, Bremen.* iv. 197; unarmed, stem smooth, floriferous branches slender and petioles puberulous, stipules broadly linear obtuse deciduous, leaves petioled ovate or ovate-lanceolate cordate long-acuminate 3-lobed unequally subincised-serrate hairy then glabrate above, paler and puberulous on the nerves beneath, flowers crowded subfascicled shortly peduncled forming a short narrow inflorescence, bracts ovate-lanceolate acute sometimes denticulate, calyx yellow tomentose cleft hardly to the middle, lobes shortly triangular.—Leaves exactly like those of *R. palmatus*, Th., flowers like those of *R. moluccanus.* Nipal, *Wallich* in Herb. Copenhagen (*Focke*).—I have no idea what this species can be; I find nothing like it in Herb. Wallich.

R. HOFFMEISTERIANUS, *Kunth & Bouché Ind. Sem. Hort. Berol.* (1817 coll.) 14, is I suppose *R. niveus*, Wall.

9. **GEUM**, *Linn.*

Erect perennial herbs. *Radical leaves* crowded, pinnate; terminal leaflet large; stipules adnate to the petiole. *Flowers* solitary or corymbose, white yellow or red. *Calyx* persistent, 5-bracteolate; lobes 5, imbricate or valvate. *Petals* 5. *Stamens* very many, crowded. *Disk* smooth or with radiating grooves. *Carpels* many, on a long or short receptacle; style filiform, elongating much after flowering, straight or bent; ovules ascending. *Achenes* many, on a dry receptacle, each with a long filiform straight or bent terminal style which is often hooked at the tip.—DISTRIB. Temp. and cold regions of N. and S. hemispheres; species about 30.

SECT. I. **Geum proper.** *Style* in fruit hooked at the tip or below it.

1. **G. urbanum,** *Linn.; Boiss. Flor. Orient.* ii. 696; erect, sparsely softly hairy, lower leaves pinnatisect, leaflets 9–11 with the alternate smaller, upper sessile, flowers erect, head of hispid achenes sessile. G. Roylei, *Wall. Cat.* 713.

Western temperate Himalaya, alt. 6–11,000 ft., from MURREE to KUMAON.—DISTRIB. Siberia and westwards to the Atlantic.

Stems 1–3 ft., stout or slender, from a woody rootstock. *Terminal leaflets* of radical leaves 2–3 in. diam., orbicular, lobed and crenate; lateral much smaller, often minute, sessile, cut and lobed; cauline leaves sessile, broad, variously cut and lobed; stipules leafy, lobed and toothed. *Flowers* ½–¾ in. diam.; peduncle slender. *Petals* yellow, narrowly obovate, equalling or exceeding the calyx-lobes, which are acuminate and reflexed in fruit. *Achenes* spreading and recurved, hispid with long hairs; awn ¼ in., bent, hooked at the tip; receptacle villous.—C. B. Clarke has a very robust form from Kashmir (Alibad, 9,000 ft.).

SECT. II. **Sieversia.** *Style* straight in fruit.

2. **G. elatum,** *Wall. Cat.* 711; sparingly hairy, leaves pinnatisect, leaflets very many short lobed and crenate, flowers erect, achenes hispid. Sieversia elata, *Royle Ill.* 207, t. 39.

Subalpine and Alpine Himalaya; from KASHMIR, alt. 9–12,000 ft. to SIKKIM, alt 12–15,000 ft.

Rootstock stout, woody. *Leaves* 4–12 in., linear-oblong; leaflets ½–1 in., close and imbricating or scattered, uniform or the alternate smaller, terminal orbicular, all lobed and coarsely crenate, upper or all adnate by a broad base. *Flowering stems* with few leaves and 1–6 flowers. *Flowers* ½–1½ in. diam.. *Calyx-lobes* deltoid-ovate, acute, silky, spreading in fruit. *Petals* orbicular, yellow, much exceeding the calyx. *Carpels* sessile on the base of the calyx, clothed with long silky hairs. *Achenes* ellipsoid, acute at both ends, hairy; style ⅓ in., slender.

VAR. *humile*, Royle l. c.; smaller, 1-flowered, Nipal Kumaon and Sikkim, alt. 12–15,000 ft. G. adnatum, *Wall. Cat.* 712. Potentilla adnata, *Wall. MSS.*; *Lehm. Pugill.* ix. 9; *Revis. Potentill.* 47, t. 17.

10. **FRAGARIA,** *Linn.* Strawberry.

Perennial scapigerous herbs, with creeping stolons. *Leaves* digitately 3-rarely 5-foliolate very rarely pinnate or simple; stipules adnate to the petiole. *Flowers* white or yellow, often polygamous. *Calyx* persistent, with 5 bracteoles at its base; lobes 5, valvate in bud. *Petals* 5. *Stamens* many, persistent. *Carpels* many, on a convex receptacle; styles ventral, persistent; ovule 1, ascending. *Achenes* many, minute, sunk in the surface of a large fleshy receptacle.—DISTRIB. Temp. and mountain regions of the N. hemisphere, S. America, Sandwich Islands, Bourbon; species 6 or 7.

* *Flowers yellow.*

1. **F. indica,** *Andr. Bot. Rep.* t. 479; very slender, leaflets 3–5 obovate serrate crenate or toothed, peduncles solitary axillary 1-flowered, bracteoles large cuneate-obovate 3–5-fid. *Roxb. Fl. Ind.* ii. 520; *Wight & Arn. Prodr.* 300; *Wight Ic.* t. 989; *Bot. Reg.* t. 61; *Wall. Cat.* 1236, *excl. No.* 3 *for the most part.* F. malayana, *Roxb. Fl. Ind.* ii. 520. F. nilgirica, *Zenker Pl. Ind. Dec.* I. 7, t. 9. F. arguta, *Lindl. in Wall. Cat.* 1237. F. Roxburghii, *Wight & Arn. Prodr.* 300, *name only*. Duchesnea fragarioides, *Sm. in Trans. Linn. Soc.* x. 373; *Miq. Fl. Ind. Bat.* i. pt. 1, 372, et D. chrysantha, *Miq. ibid.* D. fragiformis, *Don Prodr.* 233. Potentilla denticulosa *and* Wallichiana, *Ser. in DC. Prodr.* ii. 573, 574. P. Durandii, *Torr. & Gr. Fl. N. Am.* I. 444. P. fragariæfolia, *Klotzsch in Reis. Pr. Waldem. Bot.* t. 10. P. trifida, *Lehm. in Otto Garten. und Blumenzeit.* vii. 263; *Revis. Potentill.* 175.

Temperate and subtropical HIMALAYA and along the foot of the hills from the PUNJAB to ASSAM, ascending to 7500 ft. in the east and 8000 ft. in the west. KHASIA MTS. NILGHIRI MTS. PENANG (*Roxburgh*)—DISTRIB. Affghanistan, Mountains of the Malay Islands, Japan, Corea, and Formosa.

More or less silkily hairy. *Rootstock* stout, with many long slender prostrate stems. *Leaves* distant; leaflets rarely 5, 1–1½ in., petiolulate or sessile, membranous, simply

or doubly crenate or toothed or serrate, base cuneate entire, nerves parallel; petiole 1–5 in., very slender; stipules leafy, toothed. *Peduncles* very slender, equalling the petioles, naked. *Flowers* ½–1 in. diam. *Calyx-lobes* ovate or lanceolate; bracteoles narrow or broad, often greatly exceeding the calyx-lobes, rarely quite entire. *Petals* obovate, cordate, yellow. *Fruit* spherical or oblong, bright red, spongy, insipid; achenes minute, obscurely pitted.

A very variable plant. I refer *Potentilla denticulosa* doubtfully to it on the authority of J. Gay (in Herb.), who has further verified the reference of the American *P. Durandii* to *F. indica*; M. E. Durand in 1860 having informed him that this plant was sent to him from Savannah, where it grew in the streets, and was no doubt introduced.

** *Flowers white.*

2. **F. vesca,** *Linn.*; leaflets sessile or nearly so many-toothed, fruit globose or subglobose, calyx-teeth usually entire.

VAR. *nubicola*; slender, silvery, nearly glabrous, runners filiform, hairs on petioles and few flowered peduncles appressed, calyx-lobes narrow spreading in fruit. F. nubicola, *Lindl. in Wall. Cat.* 1238.

VAR. *? collina*, slender or stout runners with spreading hairs, hairs on petioles and few- or many-flowered peduncles more copious spreading, calyx-lobes narrow or broad spreading or suberect in fruit.

Temperate Himalaya, from MURREE and KASHMIR, alt. 5–10,000 ft., to SIKKIM, alt. 6–13,000 ft.—DISTRIB. *F. vesca*, Affghanistan, Java, N. temp. zone.

I am quite unable to identify the Indian strawberries by means of the characters given by authors to the European species, which differ in their several works. *F. vesca* is defined by Boissier (Fl. Orient.) as having the petioles with spreading hairs, and the peduncles with spreading or appressed ones; Ledebour (Fl. Ross,) describes the hairs of its peduncles as appressed, and Decaisne (Jardin fruitier) as spreading, In the common Himalayan *Fragaria* the hairs of both petals and peduncles are appressed in some forms, in others those of the petiole are spreading and of the peduncle appressed, and in still others both petiole and peduncle have spreading hairs. As the specimens with most appressed hairs appear from dried specimens to have spreading calyx-lobes I have referred them to *R. vesca* as var. *nubigena*. I must remark however that J. Gay, who was the greatest living authority on *Fragaria*, and to whom I sent a series of specimens, has regarded most of them as *F. collina*, but evidently with doubt; for a Simla and a Kashmir specimen he tickets *F. collina?* and then crosses out the mark of interrogation, and a Kishtwar specimen he tickets first *elatior?* and then crosses that name out substituting *collina?* and finally crosses out the mark of interrogation: of those marked *collina* by Gay; some have appressed, others spreading hairs on both peduncle and petiole. The Sikkim specimens, again, which I describe above as var. *nubicola*, are marked *F. vesca* without a doubt by M. Gay. This slender silvery form occurs throughout the temperate Himalaya; it has often small accessory pinnules on the petiole far below the tip and toothed or entire calyx-lobes.

3. **F. nilgerrensis,** *Schldl. in Hohenack. Plant. Ind. Or. Exsicc. No.* 1518; very robust, runners petioles and peduncles clothed with long stout spreading hairs, fruit subglobose or depressed, calyx-lobes entire spreading or suberect in fruit. *J. Gay in Ann. Sc. Nat. Ser.* 4, viii. 206. F. elatior, *Wight & Arn. Prodr.* 300; *Wight Ic.* t. 988.

KHASIA MTS., alt. 5000 ft. *J. D. H. & T. T.* NILGHIRI MTS., *Wight*, &c.

This will probably prove to be another form of *F. vesca*, and I find an approach to it amongst the Himalayan specimens of that plant; and there are specimens of it marked as from Sikkim in Griffiths' collection, but they are probably from Khasia and mislabelled. Gay who elaborately describes it says that the calyx-lobes are erect; this they seem to be in dried specimens, but Wight's excellent figure (which Gay does not refer to) shows them to be spreading. The fruit is white with a pale pink tint, and not worth eating; it is globose and inclined to be conoidal in the Nilghiris, but a very depressed sphere in Khasia.

4. **F. Daltoniana,** *J. Gay in Ann. Sc. Nat. Ser.* 4. viii. 204; smaller, slender, hairy or nearly glabrous, runners filiform, leaflets petiolulate with few teeth, flowers solitary, fruit elongate-ovoid or fusiform, calyx-lobes and bracteoles toothed spreading in fruit. F. sikkimensis, *Kurz in Journ. As. Soc. Beng.* 1875, ii. 206.

Sikkim Himalaya, alt. 10–15,000 ft., *J. D. H.*, *Kurz*, &c.

A very distinct species, at once recognizable by its smaller proportions, petiolulate leaflets with few teeth, toothed calyx-lobes, bracteoles, and curious fruit, which is often nearly 1 in. by 1/2 in. broad, of a bright scarlet but with little flavour.

11. POTENTILLA, *Linn.* Cinquefoil.

Perennial herbs, rarely shrubs. *Leaves* compound; stipules adnate to the petiole. *Flowers* white or yellow, rarely red, solitary or in corymbose cymes. *Calyx* persistent, 5- rarely 4-bracteolate; lobes as many, valvate in bud. *Petals* as many, sometimes narrow. *Stamens* many, rarely few and definite. *Disk* annular or coating the calyx-tube. *Carpels* many, rarely 1 or few, on a small dry receptacle; style persistent or deciduous, ventral or terminal; ovule 1, pendulous. *Achenes* many, on a dry receptacle.—Distrib. N. temp., Arctic, and mountain regions, very few are found in the south; species 120.

The species of *Potentilla* are very difficult of discrimination, being chiefly mountain plants varying in habit and stature with elevation, much as *Ranunculi* do. I have no doubt that several here regarded as peculiar, will prove forms of more western ones, and those again of one wide spread European, Asiatic, and American plant. Lehman's "Revisio Potentillarum" is of little scientific value, and the 200 species it enumerates are reducible by at least one-third. Boissier in his "Flora Orientalis" has done excellent work. The character of the calyx and petals are excessively variable, and that of the terminal and ventral style is not so good as might be supposed, the outer carpels often differing somewhat from the inner in this respect. Smooth and wrinkled achenes are not always definite characters. I am inclined to think that the structure of the stigma is useful as a guide to the affinities of the species, but I hesitate to introduce it without a study of the whole genus.

Sect. I. **Sibbaldia.** *Stamens* 4, 5 or 10. *Flowers* often unisexual.

* *Leaves simple.*

1. **P. trullifolia,** *Hook. f.*; forming dense silky moss-like tufts, leaves trowel-shaped or 1/2-orbicular tip truncate 3-fid, stamens 5, achenes many smooth, styles short ventral.

Sikkim Himalaya; rocky places on the Tibet frontier, alt. 16–17,000 ft., *J. D. H.*

Tufts matted, an inch high, soft, of densely packed short branches from a woody slender rootstock. *Leaves* 1/4 in., densely imbricated, flat, clothed on both surfaces with long silky hairs, tip with 3 broadly triangular obtuse teeth; petiole short; stipules very broad, membranous, with triangular acute free portions. *Flowers* solitary, subsessile, 1/8 in. diam. *Calyx* hemispheric, silky; tube very short; lobes ovate, obtuse; bracteoles much smaller, narrow, oblong, obtuse. *Petals* not seen. *Stamens*, rudiments of 5 seen. *Achenes* about 10, on a villous receptacle, quite smooth.

** *Leaves digitately 3- or 5-foliolate.*

2. **P. Sibbaldi,** *Haller f. in Ser. Mus. Helvet.* i. 51; leaflets 3 obovate-cuneate truncate 3–5-fid, flowers in branched cymes yellow 5-merous, achenes smooth, style short ventral. P. procumbens, *Clairv. Man. d'Herbor. en Suisse*

166. P. Sibbaldia, *Griesselich Statistik d. Flor. Badens.* 239. Sibbaldia procumbens, *Linn.* S. parviflora, *Willd.*; *Boiss. Fl. Orient.* ii. 727. S. cuneata, *Edgw. in Trans. Linn. Soc.* xx. 44. S. cuneata, *Kunze in Linnæa*, xx. 59.

ALPINE HIMALAYA and WESTERN TIBET, alt. 12–15,000 ft.—DISTRIB. Lofty mountains of the N. temp. zone; Arctic regions.

Covered with rather stiff silky hairs; rootstock woody, depressed, branched. *Leaves* chiefly radical; petiole $\frac{1}{2}$ in., slender; leaflets $\frac{1}{4}$–$\frac{1}{2}$ in., rounded at the base, lobes short broad subacute, nerves obscure; stipules large, membranous. *Flowering stems* $\frac{1}{2}$–6 in.; cymes leafy and silky. *Flowers* pedicelled. *Calyx* $\frac{1}{4}$ in.; lobes triangular-lanceolate, erect in fruit; bracteoles linear. *Petals* narrowly obovate, hardly exceeding the calyx. *Stamens* 5–10 (Edgew.) short. *Achenes* ovoid, smooth, obtuse, receptacle flat hairy.—I can detect no difference whatever between the *Sibbaldia parviflora* Willd. and *S. procumbens*, L., which latter varies greatly in size and hairiness and size of petals. J. Gay (in Herb. Hook.) failed to distinguish them.

VAR. *micrantha*; more densely tufted and smaller in all its parts, flowers sometimes solitary and alternate sessile amongst the leaves, calyx $\frac{1}{8}$–$\frac{1}{6}$ in. long. Western Tibet; Tibetan region of Sikkim, alt. 16,000 ft.

3. **P. perpusilla,** *Hook. f.*; very small, silky, leaflets 3 obovate-cuneate truncate 3-fid, flowers in very short cymes 4-merous, achenes smooth, style short ventral.

ALPINE HIMALAYA, from Champura, *Jacquemont*, to KUMAON, alt. 12,000 ft. *Strach. & Winterb.* (with Potentilla 26), and the Tibetan region of SIKKIM, alt. 16,000 ft., *J. D. H.*

A much smaller plant than *P. Sibbaldi* in all its parts, and always 4-merous. *Leaflets* $\frac{1}{6}$–$\frac{1}{3}$ in. *Flowers* $\frac{1}{8}$ in. diam. *Petals* narrowly obovate, *Stamens* 4. *Achenes* 10–12.

4. **P. tetrandra,** *Bunge Enum. Pl. Alt.* 17 (Sibbaldia); densely tufted, diœcious, silky, shining, leaflets 3 obovate-cuneate 3-fid, flowers yellow solitary or in pairs subsessile 4-merous, achenes 4, style terminal. Dryadanthe Bungeana, *Ledeb. Flor. Ross.* ii. 33. Sibbaldia procumbens, *var.* tibetica, *Hook. f. & Thoms. Herb. Ind. Or.*

WESTERN TIBET, alt. 14–18,000 ft., *Falconer, Thomson*, and Tibetan region of SIKKIM, alt. 15–16,000 ft., *J. D. H.*—DISTRIB. Altai Mts.

Forming dense moss-like patches covered with stout silky hairs. *Stem* densely leafy, 1–2 in. *Petiole* $\frac{1}{6}$–$\frac{1}{4}$ in.; leaflets about as long. *Flowers* rarely on short peduncles, usually sessile amongst the leaves, $\frac{1}{6}$ in. diam. *Calyx-lobes* triangular; bracteoles linear. *Petals* obovate, much larger than the calyx, golden yellow. *Stamens* 4, very short. *Achenes* glabrous, smooth.

5. **P. axilliflora,** *Hook. f.*; sparsely silky, stems prostrate very long and slender leafy throughout, leaflets 3 obovate acutely toothed, stipules small ovate acute, flowers all axillary small on capillary pedicels, petals minute, stamens 5, carpels many, styles sub-basal. Fragaria indica, *Wall. Cat.* 1236, 3 *in part.*

Western Himalaya, KUMAON, *Herb. Wallich.*

Rootstock as big as a walnut, apparently very short and broad, sending off 60–100 very weak almost filiform stems 1–2 ft. long, which trail on the ground, and are leaf- and flower-bearing along their length. *Leaves* chiefly cauline; leaflets $\frac{1}{3}$–$\frac{3}{4}$ in., sessile, membranous, base cuneate entire; petiole $\frac{3}{8}$–$\frac{3}{4}$ in.; stipules small, broad, membranous, toothed. *Flowers* $\frac{1}{4}$ in. diam.; pedicels $\frac{1}{2}$–$\frac{3}{4}$ in. *Calyx* hairy, lobes triangular-ovate; bracteoles linear-oblong. *Petals* very small, oblong, yellow? *Sta-*

mens short. *Carpels* about 20. *Achenes* many, rounded, hard, slightly wrinkled; receptacle villous.

6. **P. purpurea,** *Royle Ill.* 208, t. 40, f. 3 (Sibbaldia); polygamous, leaflets 5 obovate-cuneate 3-fid, flowers purple 5-merous.

N. W. HIMALAYA, *Royle.*

I know this plant only from the figure and meagre description published by Royle, who gives no habitat, and I suppose it to be founded on a drawing of a native artist. The figure represents a procumbent branching rooting flexuous rhizome or stem 4 in. long, clothed with stipular sheaths, and bearing short lateral branches with tufts of leaves and flowers. *Leaves* $\frac{1}{3}$–$\frac{2}{3}$ in. long, hairy; leaflets 5, sessile, $\frac{1}{8}$ in., obovate-cuneate, 2–3-fid at the apex, green above, paler beneath. *Flowers* $\frac{1}{5}$ in. diam., solitary or twin from the axils of the leaves, peduncle naked. *Calyx* hairy, lobes triangular-ovate; bracteoles linear. *Petals* longer than the calyx, narrowly obovate, pale purple. *Disk* dark purple. *Stamens* 5. *Achenes* ovoid, smooth.

*** *Leaves pinnate.*

7. **P. albifolia,** *Wall. Cat.* 1018; stems very slender spreading, leaves pinnate, leaflets few subopposite or alternate obovate coarsely toothed white-tomentose beneath, stipules large, flowers solitary axillary, achenes many, style short ventral. Sibbaldia potentilloides, *Camb. in Jacq. Voy. Bot.* 54, t. 67.

Subalpine Himalaya from KASHMIR, alt, 8–10,000 ft., to SIKKIM, alt. 12–15,000 ft., *J. D. H., C. B. Clarke.*

Rootstock stout. *Stems* many, 6–12 in., flexuous, branched, pubescent. *Lower leaves* 2–4 in.; leaflets 5–9, very unequal, $\frac{1}{2}$–1 in., orbicular or obovate, lateral smaller, lower smallest, green and glabrous above, snow-white beneath; petiole very slender; stipules sometimes $\frac{1}{2}$–$\frac{3}{4}$ in., loose, sheathing, brown, acute, adnate for half their length to the petiole. *Flowers* $\frac{1}{4}$ in. diam., on slender peduncles 1–2 in. *Calyx* white-tomentose, lobes triangular; bracteoles linear-oblong. *Petals* small, oblong, obtuse, yellow. *Stamens* 5. *Achenes* numerous, large, deeply furrowed; receptacle tomentose.

SECT. II. **Trichothalamus.** *Stamens* numerous. *Flowers* sometimes diœcious. *Receptacle* with long erect stiff hairs, which entirely conceal the achenes.

* *Leaves pinnate.*

8. **P. fruticosa,** *Linn.*; *Boiss. Flor. Orient.* ii. 703; diœcious, shrubby, silky, leaflets 3–7 oblong-lanceolate or linear quite entire apiculate, flowers solitary, petals obovate exceeding the calyx, achenes furnished with a long pencil of silky hairs, style short subterminal. P. rigida, *Wall. Cat.* 1009; *Lehm. Revis. Potentill.* 19, t. 1. P. Arbuscula, *Don Prodr.* 256 (nepalensis 229); *Wall. Pl. As. Rar.* iii. 16, t. 228; *Lehm. Revis. Potentill.* 18. P. reticulata, *Bertol. Piant. Nuov. As.* i. 6, t. 2.

Temperate and subalpine Himalaya, from KASHMIR, alt. 8–12,000 ft., to SIKKIM, alt. 12–16,000 ft.—DISTRIB. N. Asia and Europe to the Pyrenees and England.

A much branched rigid robust erect or prostrate leafy low or tall shrub, 6 in.–4 ft. *Leaves* imbricating, $\frac{1}{2}$–1$\frac{1}{2}$ in.; leaflets $\frac{1}{8}$–$\frac{1}{2}$ in., coriaceous; petiole slender; stipules large, membranous, obtuse. *Flowers* usually solitary, $\frac{3}{4}$–1$\frac{1}{2}$ in. diam.; peduncle rarely 1 in., silky; bracteoles entire or 2-fid. *Calyx-lobes* ovate or lanceolate. *Petals* broadly obovate. *Stamens* many. *Achenes* numerous, minute, with long hairs, and sunk in the long hairs of the receptacle.

VAR. *glabrata*; very short, glabrate, leaflets lanceolate. Sikkim, alt. 15,000 ft.

VAR. *ochreata*; Lehm.; slender, very silky, almost white, leaflets much-reduced linear-lanceolate with revolute margins, flowers smaller. P. ochreata, *Lindl. in Wall.*

Cat. 1028; *Lehm. Revis. Potentill.* 17. Western Tibet, from N. of Kumaon to Ladak, alt. 13–17,000 ft.

VAR. *pumila*; depressed, very dwarf, branches spreading, leaflets very silky ⅛–¼ in., flowers sessile ⅓–½ in. diam. P. Lindenbergii, *Lehm. in Otto Gart. und Blumenzeit.* vii. 339; *Revis. Potentill.* 14, t. 2.

VAR. *Inglisii*; very dwarf, most densely tufted, leaflets ⅓ in. linear-lanceolate, flowers often peduncled, peduncle bracteate. P. Inglisii, *Royle Ill.* 207, t. 41; *Lehm. Revis. Potentill.* 18. Kumaon and West Tibet, alt. 14–15,000 ft.—Very near *P. biflora*, Willd. of the Altai and American Polar regions, which has obcordate petals.

VAR. *armerioides*; dwarf, forming dense hard tufts or cushions, branches with the densely crowded spreading leaves ¾ in. diam., leaflets linear-lanceolate very rigid, margins revolute to the midrib, achenes glabrous. Borders of Sikkim and Tibet, alt. 17–17,500 ft., *J. D. H.*

9. **P. Salessovii,** *Steph. in Mem. Soc. Nat. Mosc.* ii. 6, t. 3; silky, shrubby below, leaflets 7–9 oblong obtuse coarsely obtusely toothed above the middle, flowers large cymose, achenes villous, style ventral very slender. *Lehm. Monogr. Potentill.* t. 1; *Revis. Potentill.* 13. P. discolor, *Camb. in Jacq. Voy. Bot.* 53, t. 65. Comarum Salessovii, *Bunge*; *Ledeb. Flor. Ross.* ii. 63.

WESTERN TIBET, LAHUL and northern border of KASHMIR, alt. 11–14,000 ft.—DISTRIB. Altai and Thian Schan Mts.

Stems 1–3 ft., woody and as thick as the finger below. *Leaves* 4–6 in.; leaflets 1–1½ in., subopposite, subequal, petiolulate, coriaceous, white or green beneath, base rounded; petiole stout; stipules membranous, caudate. *Flowers* 1 in. diam., very numerous, peduncled, in branched leafy cymes. *Calyx* tomentose, lobes ovate or lanceolate, acuminate; bracteoles linear. *Petals* obovate-oblong, exceeding the calyx, white? *Stamens* many, filaments long. *Achenes* minute, many, immersed in the long receptacular hairs, clothed with long silky hairs.

** *Leaves digitately 3-foliolate.*

10. **P. ambigua,** *Camb. in Jacq. Voy. Bot.* 51, t. 62; tufted, silky or glabrous, stem very short leafy, leaflets 3 obovate- or orbicular-cuneate obtusely 3-toothed or 3-fid at the broad tip, stipules leafy, flowers solitary peduncled, petals much exceeding the calyx, achenes many smooth, style slender ventral. *Hook. Bot. Mag.* t. 4613; *Lehm. Revis. Potentill.* 21. P. cuneifolia, *Bertol. Misc.* xxiv. 15, t. 2. P. cuneata, *Wall. Cat.* 1015 *in part.*

Temperate and Alpine Himalaya; from KASHMIR, alt. 10–14,000 ft., to SIKKIM, alt. 9–15,000 ft.

Rootstock stout or slender. *Stems* 1–6 in. *Leaflets* ¼–½ in., sometimes as broad as long, sometimes glabrate and glaucous beneath; petiole ¼–1 in.; stipules variable. *Flowers* ½–1 in. diam.; peduncle ¼–1 in., naked. *Calyx* pubescent or glabrate; lobes triangular, acute; bracteoles elliptic, obtuse. *Petals* orbicular, yellow. *Achenes* sunk in the very long receptacular hairs, smooth, clothed with long silky hairs.—Foliage of *P. Sibbaldi.*

11. **P. eriocarpa,** *Wall. Cat.* 1012; nearly glabrous, rootstock very stout, peduncles and long petioles very slender, leaflets 3 cuneate incised and toothed above the middle, flowers solitary, petals much larger than the calyx, achenes very small, style slender terminal. *Lehm. Revis. Potentill.* 22, t. 4.

Tibetan region of KUNAWAR, KUMAON, NIPAL, and SIKKIM, alt. 12–14,000 ft.

Rootstock long; branches like rootstocks, ascending, 4–10 in. long, as thick as a swan's quill, densely clothed with imbricating silky or woolly stipular sheaths; flowering stems from the tips of their branches, very slender, 2–18 in., suberect, glabrous or faintly silky, with one or two subsessile leaves above the middle. *Leaves* very few;

leaflets ¼–1½ in., thin, bright green on both surfaces, 3-multifid; petiole ½–3 in.; stipules silky, acute. *Flowers* 1–1½ in. diam.; peduncle ½–3 in., naked. *Calyx* glabrous; lobes ovate, acute; bracteoles broadly elliptic, sometimes exceeding the calyx-lobes. *Petals* orbicular-obcordate, yellow. *Achenes* minute, clothed with very long flexuous hairs.

SECT. III. **Potentilla proper.** *Stamens* numerous. *Achenes* not concealed by the long hairs of the receptacle.

* Root perennial.

† *Leaves interruptedly pinnate, the alternate one or more pairs much smaller.* (*See also* 19 P. leuconota.)

12. **P. Mooniana,** *Wight Ic.* t. 233; hirsute or villous, leaflets very many pair elliptic obtuse serrate paler beneath, the smaller orbicular or cuneate, flowers panicled or corymbose, bracteoles broad toothed, achenes quite smooth, style very short ventral. *Lehm. Revis. Potentill.* 54. R. polyphylla and barbata, *Wall. Cat.* 1030, 1026; *Lehm. l. c.* 53; *Monogr. Suppl.* 1, t. 5. P. sordida, *Klotzsch. in Reis. Pr. Wald. Bot.* t. 9.

Temperate Himalaya; from KUMAON, alt. 11,500 ft. to SIKKIM, alt. 10–12,000 ft. KHASIA MTS., alt. 4–5000 ft. CEYLON, Horton plains, alt. 7000 ft.

A tall erect-branched leafy plant in Ceylon and at the lower elevations of N. India, but becoming stunted with almost prostrate flowering-branches at 12,000 ft., very variable in amount of hairiness, and sometimes having a few of the early leaves silky; rarely (*P. polyphylla*) glabrate with appressed hairs. *Leaves* 6–10 in., narrow, pinnate nearly to the base, the leaflets smaller downwards; larger leaflets, ½–1½ in., smaller $\frac{1}{10}$–½ in., all sessile, membranous, coriaceous at higher elevations, brown when dry; petiole slender, silky; lower stipules usually membranous, upper leafy and toothed or lobed. *Inflorescence* from an open dichotomously branched lax panicle with slender pedicels, to a short almost umbellate corymb with stiff stout pedicels (*P. barbata*). *Flowers* ⅓–⅔ in. diam. *Calyx* villous, lobes ovate, acute; bracts larger or smaller than the lobes, ovate or cuneate, usually 3-toothed or -lobed. *Petals* obovate-orbicular. *Achenes* on an elevated hairy receptacle, quite without wrinkles.—I can find no characters upon which to found definable varieties of this plant, which by its occasional silky leaves shows an affinity with *P. fulgens.*

13. **P. fulgens,** *Wall MSS. in Hook. Bot. Mag. under* t. 2700; softly silky, leaflets very many pair elliptic oblong or obovate obtuse sharply serrate clothed beneath with silvery hairs, interposed pairs minute, flowers panicled or corymbose, bracteoles quite entire or 2–3-fid, achenes small smooth, style short slender ventral. *Lehm. Revis. Potentill.* 54. P. splendens, *Wall. in Hook. Bot. Mag.* t. 2700; *Cat.* 1017; *Don Prodr.* 330; *Sweet Brit. Fl. Gard.* t. 191. P. Siemersiana, *Lehm. Ind. Sem. Hort. Hamb.* 1820, 8; *Pugill.* i. 31. P. lineata, *Trevir. in Spreng. Syst. Veg.* ii. 534; *Reich. Icon Exot.* t. 8. P. Naspata, *Ham. MSS.*

Temperate Himalaya; from KUNAWAR, alt. 6–7000 ft. to SIKKIM, alt. 7–13,000 ft. KHASIA MTS., alt. 4–5000 ft.

As variable as *P. Mooniana,* and in a very similar manner; and further almost connected with it by var. *intermedia*; but usually more robust, with more copious spreading hairs on the petiole and stem, and with the brilliant silvery clothing of the under surface of the leaves and inflorescence sometimes extending to the upper surface. *Rootstock* very stout. *Stems* 6–24 in., stout, ascending or erect, leafy. *Leaves* 2–6 in.; larger leaflets ½–1½ in., crowded or not, sometimes with deeply impressed nerves above, at others quite flat, teeth very numerous and acute; petiole rather stout; stipules and inflorescence and petals as in *P. Mooniana,* but calyx usually very silvery,

lobes acute; bracteoles very variable. *Achenes* on an elevated hairy receptacle.—Reichenbach figures the petals as retuse; they seem hardly so in our specimens, nor are they so represented in Bot. Mag. Lehmann's name *P. Siemersiana* published in 1820 has the priority, but is suppressed by the author himself (Revis. 55).

VAR. *intermedia*; leaflets fewer more oblong slightly silvery beneath, calyx green sparsely silky or hairy as in *P. Mooniana.*—Sikkim at Jongri, alt. 13,000 ft., *C. B. Clarke.*

14. **P. anserina,** *Linn.; Boiss. Fl. Orient.* ii. 707; rootstock sending out long racemes, leaves lanceolate, leaflets 6–10 pair with minute alternating ones obovate or oblong deeply sharply toothed silvery with white hairs beneath, scapes from the rootstock and from nodes on the runners slender naked 1-flowered, achenes many. P. pseudo-anserina, *Bertol. Misc.* xxiv. 15, t. 3.

WESTERN TIBET, PITI, &c., alt. 12–16,000 ft., *Thomson*; Balti prov. of KASHMIR, alt. 7700 ft., *C. B. Clarke.*—DISTRIB. Kashgar, N. Asia, and from Persia westward to the Atlantic, N. America, Australia.

Rootstock very short; racemes a foot and more long. *Leaves* forming a spreading tuft from the crown, 2–10 in., green above, silky beneath; leaflets $\frac{1}{4}$–2 in., sessile, smaller ones often minute lanceolate and entire; stipules membranous. *Flowers* $\frac{1}{2}$–1 in. diam.; scape 1–6 in. *Calyx-lobes* lanceolate, acuminate; bracteoles lobed or cut. *Petals* yellow, orbicular. *Achenes* numerous, smooth, on a villous elevated receptacle.

†† *Leaves not interruptedly pinnate (alternate leaflets not smaller except sometimes in* 19. P. leuconota).

15. **P. Leschenaultiana,** *Ser. in DC. Prodr.* ii. 584; robust, villous, hairs long spreading soft and silky, leaflets 5–7 obovate or broadly elliptic obtuse coarsely toothed white beneath, flowers corymbose, petals obcordate, achenes on an elevated receptacle wrinkled, style subterminal. *Wight Ic.* t. 990; *Wight & Arn. Prodr.* 301; *Lehm. Monogr. Potentill. Suppl.* 1, t. 3; *Revis.* 41. P. Grahamiana, *Wight Cat.*

Temperate Western Himalaya, from KASHMIR to KUMAON. NILGHIRI HILLS abundant.

Rootstock short, stout. *Leaves* 1–10 in.; leaflets usually 5, sometimes 9 or even 11, $\frac{1}{4}$–1 in., membranous or rather coriaceous, teeth acute or obtuse; petiole slender; stipules, lower membranous entire, upper often leafy and toothed. *Flowering stems* erect or ascending, 2–18 in., usually corymbosely branched above, the corymbs lax and spreading or close. *Flowers* subsessile or long-pedicelled, $\frac{1}{3}$–$\frac{2}{3}$ in. diam., yellow, rarely white. *Calyx* villous or silky, lobes triangular or oblong, acute or subacute; bracteoles linear, oblong, acute. *Petals* longer than the calyx, orbicular obcordate or more obcuneate. *Carpels* numerous. *Achenes* on an elevated and often globose hairy receptacle, variable in size, minutely wrinkled.—A most variable plant, often a roadside weed.

VAR. *bannehalensis*; tall, more slender, copiously branched above, leaflets silvery white (rarely green) beneath, flowers 1 in. diam. on slender pedicels, calyx silky, lobes very acute. P. bannehalensis, *Camb. in Jacq. Voy. Bot.* 52, t. 64; *Lehm. Revis. Potentill.* 41.—Kumaon to Kashmir, alt. 6–12,000 ft.

16. **P. fragarioides,** *Linn.; Ledeb. Fl. Ross.* ii. 38; villous or hairy, hairs soft silky, leaflets 5–7 elliptic or oblong obtuse coarsely toothed hirsute but not white or silvery beneath, flowers corymbose, petals obovate or obcordate, achenes on an elevated receptacle, style subterminal. *Lehm. Revis. Potentill.* 42; *Maximov. Diagn. Dec.* xv. 158. P. Gerardiana, *Wall. Cat.* 1023; *Lehm. l.c.* 42. P. variabilis, *Klotzsch in Reis. Pr. Waldem. Bot.* t. 11. P. Munroana, *Lehm. Ind. Sem. Hort. Hamb.* 1849, 7; *Revis. Potentill.* 40, t. 13.

Temperate Himalaya, from WAZERISTAN, *Stewart*, to KUMAON and BHOTAN.—DISTRIB. Siberia to China and Japan.

A smaller plant (sometimes only 2 inches high) than *P. Leschenaultiana*, with which it is almost, if not quite, united through its var. *bannehalensis*, less villous, with smaller leaves, more branched open corymbs, longer and more slender pedicels, more acute calyx-lobes and smaller fruit.

VAR. *stolonifera*; Lehm.; Maxim. Diagn. Dec. xv. 160; stoloniferous, leaflets sometimes 9, the alternate smaller. Bhotan, *Griffith*; Sirmore, *Wallich.*—I give the Sirmore habitat on Maximovic's authority; the specimens in Herb. Wallich have no stolons and are referable to the ordinary form of the plant. According to the same authority this variety is found in Japan and Kamtschatka.

17. **P. Clarkei,** *Hook. f.*; leafy, stout, hispid with long spreading hairs, leaves short, leaflets 5–7 lower much smaller obovate very coarsely crenate-toothed, flowers pedicelled in dichotomous cymes with very divaricate leafy branches and involucriform cut leaf-bracts, calyx-lobes acute, achenes many minutely wrinkled, style slender terminal.

KASHMIR, Sirinuggur, alt. 7000 ft., *C. B. Clarke.*

Stems 1 ft., ascending from a woody rootstock. *Leaves* 1–2 in., covered with spreading hairs on the petiole and both surfaces; leaflets ½–1 in., approximate, sessile, rigidly coriaceous, toothed ⅓ way down, pale green when dry, lower lateral sometimes cuneate and 2–3-toothed; stipules on the stem large, semi-ovate, leafy, entire or toothed. *Inflorescence* very stiff, spreading, dichotomously branched, with sessile leaves; pedicel stout, ½–1 in. *Flowers* ½ in. diam. *Petals* obovate, yellow. *Stamens* numerous. *Achenes* rather large, numerous, on an elevated hairy receptacle.—The rigid pubescence, habit, inflorescence and carpels at once distinguish this from its allies; its floral leaves form a sort of involucre of narrow almost pinnatifid spreading leaflets.

18. **P. Griffithii,** *Hook. f.*; tall, branched, hoary, leafy, leaves short-petioled, leaflets 5–7 white with appressed pubescence beneath 3 terminal leaflets obovate coarsely crenate-serrate lateral smaller orbicular or oblong, stipules leafy deeply toothed, flowers in panicled corymbs sessile or pedicelled, calyx-lobes obtuse or subacute, achenes very minute glabrous, style very short subterminal. Potentilla 15, *Herb. Ind. Or. H. f. & T.*

Eastern Himalaya, BHOTAN, alt. 6–8000 ft., *Griffith*; SIKKIM, alt. 7–14,000 ft., *J. D. H.*

Rootstock inclined. *Stem* 10–24 in., erect or ascending, stout or slender. *Leaves* small, 1–4 in.; leaflets ½–1 in., green and glabrous or hairy above, quite white beneath and sometimes hairy as well as clothed with white opaque down, base cuneate, lateral very irregular in size and shape, lowest pair often minute; petiole hairy; stipules large. *Flowers* ½–1 in. diam.; pedicel ½–2 in., pubescent or tomentose. *Calyx* silky, lobes acute or obtuse; bracteoles quite entire, oblong or ovate, acute or obtuse. *Petals* yellow, rounded or retuse at the tip. *Achenes* numerous, exceedingly minute, smooth, on a large globose somewhat hairy receptacle.—Near *P. discolor*, Bunge, of China, of which I have seen only a small specimen, and which is much smaller, with prostrate flowering stems and pointed tips to the calyx-lobes.

VAR. 1; very slender, flowers ⅓–½ in. on slender long pedicels, petals small.—Sikkim, alt. 7–9000 ft.

VAR. 2.; robust, sometimes ½–4 in. high, flowers ½–1 in. on stout shorter pedicels, petals large.—Bhotan and Sikkim, alt. 12–13,000 ft.

19. **P. peduncularis,** *Don Prodr.* 230; leaflets numerous oblong closely deeply serrate clothed beneath with long soft appressed silvery hairs, above silky or glabrous, flowering stems erect or ascending equalling the leaves, flowers few large corymbose, bracteoles usually 1–2-toothed, achenes very large almost globose, style very short ventral. *Lehm. Revis. Potentill.* 66, *t.* 25. P. leuconota, *Wall. Cat.* 1021, *in part.* P. velutina, *Wall. Cat.* 1016.

Alpine Central and Western Himalaya; NIPAL, *Wallich.* SIKKIM, alt 12–14,000 ft., *J. D. H.; C. B. Clarke.*

Rootstock very long and stout, inclined. *Leaves* 2–18 in., linear- or obovate-oblong in outline, 1–2½ in. diam. across the broadest part; leaflets usually close and often imbricate, ½–1½ in., tip rounded, sessile, many-nerved, the alternate nerves smaller, upper decurrent; petiole slender or stout; lower stipules membranous, upper leafy toothed. *Flowering stems* with one or two leaves and a few-flowered irregular corymb. *Flowers* ¾ in. diam.; pedicel elongating after flowering. *Calyx* silky, lobes triangular acute; bracteoles various, usually toothed. *Petals* orbicular, yellow. *Stamens* 20–30. *Achenes* few, $\frac{1}{10}$ in. diam., four times as large as in any other Indian species, dark brown; receptacle low, villous.

VAR. *obscura*; covered with soft spreading hairs, not silvery, leaflets ½ in. broadly oblong membranous less closely serrate softly hairy on both surfaces.—Kumaon at Kalari, alt. 13,000 ft., *Strach. & Winterb.* I have but one specimen, and though I find no approach to pubescence on it, judging from the variation of *P. splendens, Mooniana,* and *Leschenaultiana,* it may well be referable to *peduncularis,* with which it altogether agrees in habit, flower, and achenes.

VAR. *Clarkei*; dwarf, sparsely silky, not silvery, leaflets narrowly oblong.—Sikkim at Yakla, alt. 14,000 ft., *C. B. Clarke.*

20. **P. leuconota,** *Don Prodr.* 230; leaflets numerous (alternate sometimes minute) oblong obtuse sharply closely serrate clothed beneath with appressed shining silky hairs, flowering stems exceeding the leaves, flowers small subumbellate, bracteoles entire, achenes few hairy or glabrous, style very short ventral. *Wall. Cat.* 1021 (*excl. spec. of peduncularis*); *Lehm. Revis. Potentill.* 65, t. 24.

Alpine Himalaya; GARWHAL, 10,000 ft., *Madden*; NIPAL, *Wallich*; SIKKIM, alt. 10–16,000 ft., *J. D. H.*—DISTRIB. Borneo (Kina Balou, alt. 11,000 ft., *Low*).

Rootstock very stout, sometimes 1 in. diam., inclined. *Leaves* 2–6 in., very numerous, linear in outline or rather broader upwards; leaflets close or sparse, ¼–¾ in., sessile, glabrous or hairy above; petiole with appressed hairs. *Flowering stem* erect or ascending, with usually a leaf about the middle, and an imperfect whorl of reduced ones at the inflorescence. *Flowers* ⅓ in. diam., crowded, the pedicels elongating stiffening and forming an imperfect umbel as the fruit advances. *Calyx* silky, lobes acute; bracteoles linear-lanceolate, entire. *Petals* obovate, retuse or rounded at the tip, rather longer than the calyx, yellow. *Stamens* about 20. *Achenes* not numerous.

21. **P. microphylla,** *Don Prodr.* 231; dwarf, densely tufted, sparingly silky or glabrate, leaflets very numerous small oblong or rounded pinnatifidly toothed to the middle or deeper, scape exceeding the leaves 1- rarely 2-flowered, petals much exceeding the calyx, achenes many minute quite smooth, styles very short ventral. *Wall. Cat.* 1010.

Alpine Himalaya, from GARWHAL, alt. 10–14,700 ft. to SIKKIM, alt. 15–18,000 ft.

Very variable in habit and stature, forming at high elevations dense hard moss-like tufts, strewed with golden flowers and with the leaves so small and crowded as with difficulty to be distinguished; at lower elevations the leaves are 4–6 by ¾ in. *Leaflets* opposite and alternate, uniform, $\frac{1}{16}$–½ in. broad, crowded and overlapping or scattered, flat, or complicate; petiole slender; stipules very large, membranous, obtuse. *Flowering* stem or scape erect, rarely shorter than the leaves, appressed-pubescent or silky, naked or with an undeveloped leaf and bud above the middle, rarely 2–3-flowered. *Flowers* ½–⅔ in. diam. *Calyx-lobes* acute or obtuse; bracteoles oblong. *Petals* orbicular or obovate, yellow. *Stamens* 30–40. *Achenes* in a globose head on a villous receptacle.

VAR. α. *microphylla proper*; densely tufted, rootstock stout woody, leaves 1 in., petiole filiform, leaflets $\frac{1}{10}$ in. 3–5-fid pointing forwards and upwards. P. microphylla, *Wall.* and γ. depressa, *Wall.*; *Lehm. Revis. Potentill.* 30; *Monog. Suppl.* t. 2, f. 2.

VAR. β. *glabriuscula,* Wall. Cat. 1010; less densely tufted, leaves 2–3 in., leaflets

nearly orbicular in outline flat cut in rather a fan-shaped manner, glabrous above, silky on the nerves beneath.

VAR. δ. *latiloba*, Wall. Cat. 1010; leaves 2–4 in., leaflets orbicular in outline flat toothed from below the middle to the tip, nearly glabrous beneath, scape slender 2–3-flowered sometimes decurved in fruit. P. microphylla, *Royle Ill.* 208, t. 41, f. 2.

VAR. *achilleæfolia*; leaves 1–2 in., leaflets most densely imbricate pointing obliquely forwards and upwards almost perpendicularly to the plane of the leaf very silky beneath.

VAR. *commutata*; leaves 3–4 in., leaflets $\frac{3}{8}$ in. separate flat broadly oblong pinnatifid to the middle, lobes slightly falcate glabrous above sparingly silky beneath, scapes shorter than the leaves, calyx-lobes and bracteoles obtuse. P. commutata, *Lehm. Pugill.* iii. 16; *Revis. Potentill.* 65.—Kumaon, Wall. Herb.; Bargi Kang Pass, *Str. & Winterb.* The most developed form, approaching in size and habit *P. peduncularis*, var. *obscura*, but widely differing in the fruit.

22. **P. bifurca,** *Linn.*; *Boiss. Fl. Orient.* ii. 707; small, slender, clothed with appressed silky hairs, stem leafy, leaflets 5–15 oblong entire 2–3-fid or -partite, flowers small solitary or cymose on slender peduncles, petals much exceeding the calyx, achenes glabrous except at the base, style slender ventral. P. Moorcroftii, *Wall. Cat.* 1014; *Lehm. Revis. Potentill.* 23, t. 3. P. glauca, *Camb. in Jacq. Voy. Bot.* 54, t. 66. P. bidens, *Bertol. Misc. Bot.* xxiv. 16, t. 4.

WESTERN TIBET, alt. 10–14,000 ft., and Tibetan border of LAHUL, KUMAON, and SIKKIM, alt. 13–17,000 ft.—DISTRIB. Soongaria, Altai Mts., Mongolia, Caucasus, Taurus.

Rootstock long, slender, branched, tortuous. *Stems* 4–8 in., suberect or diffuse. *Leaves* $\frac{1}{2}$–2 in.; leaflets $\frac{1}{8}$–$\frac{3}{4}$ in., usually linear-oblong, not toothed or serrate, obtuse or acute, sessile by a broad or narrow base; petiole slender; stipules acute or acuminate. *Flowers* $\frac{1}{2}$ in. diam.; peduncle $\frac{1}{2}$–1 in., naked, flexuous. *Calyx-lobes* broad, rather obtuse. *Petals* obovate, yellow. *Achenes* few, large for the size of the plant, somewhat triangular, obtuse, quite smooth, exceeding the hairs of the elevated receptacle.

23. **P. coriandrifolia,** *Don Prodr.* 232; sparsely hairy or glabrate, rootstock very thick, leaflets 6–∞ pair broadly ovate deeply cut into spreading linear or subulate hair-pointed lobes, flowering stems ascending and prostrate, flowers subumbellately corymbose, petals obcordate, achenes nearly glabrous, style slender terminal. P. meifolia, *Wall. Cat.* 1011; *Lehm. Revis. Potentill.* 29; *Monog. Suppl.* i. t. 1.

Central and Eastern Alpine Himalaya; NIPAL, *Wallich*; SIKKIM, Jongri, alt. 13,000 ft., *C. B. Clarke.*

Rootstock as thick as the thumb, inclined. *Leaves* excessively numerous, spreading, 2–4 in.; leaflets $\frac{1}{4}$–$\frac{1}{3}$ in broad, opposite and alternate, sessile, glabrous except a few hairs beneath and at the tip of every segment, cut almost to the midrib in a fan-like manner, primary segments again divided, ultimate ones acute; petiole with appressed hairs; stipules subulate. *Flowering stems* 4–6 in., numerous, declinate and then ascending, with appressed hairs and a few much reduced leaves. *Flowers* $\frac{1}{3}$ in. diam. on slender pedicels. *Calyx* glabrate; lobes triangular, acute; bracteoles linear-oblong, acute. *Petals* twice as long as the calyx, yellow. *Achenes* smooth; receptacle hairy.—The leaflets of the Sikkim specimens are much more finely divided than those of the Nipal ones.

24. **P. multifida,** *Linn.; Boiss. Fl. Orient.* ii. 710; stems many and petiole and leaves beneath softly white-tomentose without silky hairs, leaves pinnate or subdigitately 3–5-foliolate glabrous above, leaflets linear-oblong or obovate pinnatifid nearly to the base, segments linear or lanceolate ascending, mar-

gins recurved, flowers yellow $\frac{1}{2}$–$\frac{3}{4}$ in. diam. corymbose, achenes numerous minute, style terminal. *Lehm. Revis. Potentill.* 34. P. breviscissa, *Bertol. Misc. Bot.* xxiv. 17, t. 5.

KASHMIR and WESTERN TIBET, alt. 10–16,000 ft.; Niti Pass, KUMAON, alt. 16,300 ft., *Str. & Wint.*—DISTRIB. Affghanistan to the Caucasus. Northern and Central Europe and Asia from Lapland and the Pyrenees; China; temperate and Arctic N. America.

As variable in stature as *P. sericea,* and in other respects also. *Rootstock* short, erect, with many crowns of leaves and stout or slender, suberect or prostrate or ascending stems. *Leaves* $\frac{1}{2}$–2 in. diam., normally with 5 subdigitate lobes, but often with lobes more pinnately dispersed on the slender petiole which is sometimes 4 in. long; divisions of pinnules $\frac{1}{16}$–$\frac{1}{2}$ in. broad. *Flowers* $\frac{1}{4}$–$\frac{1}{2}$ in. diam., in close or open corymbose cymes, or few, or solitary in reduced forms, subsessile or on long slender pedicels. *Calyx* silky; lobes ovate, acute; bracteoles linear-oblong, obtuse. *Petals* orbicular-obovate, retuse. *Achenes* glabrous, exactly like those of *P. sericea*; receptacle hairy.—A considerable number of species in different sections of Lehman's "Revision" are referable to this species. *P. altaica,* Bunge is a state with leaflets reduced to three. *P. verticillaris,* Steph., referred here by Ledebour, is according to our specimens partly *P. multifida* and partly *sericea.*

VAR. *glabrata*; dwarf, rootstock stout, stem prostrate, leaves dense nearly glabrous, flowers small.

VAR. *minor, Ledeb. Fl. Ross.* ii. 42; very slender, leaflets pinnate cut into very slender lobes. *P. tenella,* Turcz. West Tibet, *Falconer.* Affghanistan, *Griffith.*

VAR. *Saundersiana*; very small, leaves palmately 3–5-foliolate, leaflets $\frac{1}{4}$–$\frac{1}{2}$ in. deeply incised tomentose or silky beneath. P. Saundersiana, *Royle Ill.* 207, t. 41, f. 1; *Lehm. Revis. Potentill.* 113. Western Tibet, alt. 15–17,000 ft. Also in Siberia and Arctic latitudes. Very small 3-foliolate specimens are perhaps undistinguishable from *P. nivea,* L., and var. *hololeuca* of *P. sericea* may be referable here. Dwarf forms of these three species are hardly distinguishable in a dry state.

25. **P. sericea,** *Linn.*; *Boiss. Fl. Orient.* ii. 709; white, densely silkily tomentose, stems many, leaves oblong pinnate, leaflets 5–11 silky on both surfaces, cut nearly to the base into linear subacute ascending lobes with recurved margins, flowers yellow $\frac{1}{4}$–$\frac{3}{4}$ in. diam. corymbose, petals orbicular-obovate, achenes many smooth, carpels glabrous, style terminal. *Lehm. Revis. Potentil.* 33. P. cinerascens, *Bertol. Piant. Nuov. Asiat.* 7, t. 63. P. soongarica, *Bunge*; *Ledeb. Fl. Ross.* ii. 42.

WESTERN TIBET, and Tibetan region of the Western Alpine Himalaya, from KASHMIR, alt. 9–17,000 ft. to KUMAON.—DISTRIB. Affghanistan to the Caucasus and Armenia. Soongaria, N. China, Temperate and Asiatic N. America.

A very variable plant, diminishing in size with the increasing elevation from 18 in. to 3 in.; covered more or less densely with soft shining silky hairs. *Rootstock* very stout, perpendicular, with many heads. *Leaves* crowded, 1–6 in. long, rarely more than 1 in. broad; leaflets oblong, all cut nearly to the midrib, rarely only half way to it, the terminal leaflets pedately disposed, the lateral opposite and alternate. *Flowering stems* ascending, densely tomentose, corymbosely many-flowered in the larger specimens, few or 1-flowered in the smaller. *Calyx-lobes* triangular-ovate or lanceolate, acute; bracteoles narrowly oblong, obtuse. *Achenes* quite smooth.—I can find no character whereby to separate *P. soongarica* from the common Tibetan form of *sericea* and it is difficult to retain *hololeuca* and *polyschista* as distinct forms, to which may be added certain forms of *P. pensylvanica,* L.

VAR. *polyschista,* Lehm.; dwarf, densely tufted, leaflets 3–5 short, flowers smaller—alt. 15–17,000 ft.—P. polyschista, *Boiss. Flor. Orient.* ii. 710.

VAR. *hololeuca,* Boiss.; Fl. Orient. ii. 710 (sp.); dwarf, leaflets 3–5, ovate pinnatifid to the middle, most densely white tomentose beneath, flowers few small. *Lehm. Revis. Pot.* 69, t. 27. Perhaps referable to *P. multifida*—Pugha in Little Tibet,

alt. 14–16,000 ft., *Thomson*. Small forms of this are undistinguishable in a dry state from those of *P. multifida*, especially when the leaflets are reduced to 3 or 5; its numerous forms have many names in Europe, Asia, and America.

††† *Leaves digitately 5-foliolate, or upper 3-foliolate.* (*See also states of* 24. P. multifida, 25. sericea, *and* 37. nivea).

26. **P. desertorum,** *Bunge in Ledeb. Fl. Alt.* ii. 257; *Fl. Ross.* ii. 53; *Ic.* t. 337; erect, leafy, glandular hairy, radical leaves long-petioled 5-foliolate, leaflets sessile membranous obovate coarsely crenate, cauline stipules large lanceolate quite entire, flowers in capitate leafy heads, achenes very minute wrinkled, styles short subterminal. *Lehm. Revis. Potentil.* 90.

Western Himalaya; in the dry region of KASHMIR and KISHTWAR, alt. 7–9000 ft., *Thomson, C. B. Clarke.*—DISTRIB. Soongaria.

All parts covered with soft spreading often glandular hairs. *Stems* tufted on a woody rootstock, soft, erect or ascending. *Radical* leaves 4–8 in.; leaflets 1–2 in., entire towards the cuneate base, nerves slender, green on both surfaces; petiole slender, 2–6 in.; cauline leaves short-petioled or sessile, 3-foliolate; stipules $\frac{1}{2}$–$\frac{3}{4}$ in. *Flowers* $\frac{1}{2}$–$\frac{3}{4}$ in. diam., sunk amongst the uppermost leaves; peduncle elongating in fruit, strict and stout. *Calyx* large, $\frac{1}{3}$ in. long; lobes lanceolate, acute; bracteoles entire or 3-fid. *Petals* orbicular-obovate, dark yellow, not much exceeding the calyx. *Achenes* very numerous, on a globose villous receptacle. *P. Kotschyana*, Fenzl, of Cilicia, &c., seems to me to be this plant.

27. **P. nepalensis,** *Hook. Exot. Flor.* ii. t. 88; more or less clothed with long soft spreading hairs, stem leafy branched, leaves long-petioled 5-foliolate, leaflets obovate or elliptic-obovate acute or obtuse coarsely serrate green, flowers pedicelled in dichotomous panicles, petals obcordate purple, achenes minute wrinkled. *Wall. Cat.* 1027; *Lehm. Revis. Potentill.* 91. P. bifurcata, *Wall. MSS.* P. formosa, *Don Prodr.* 232; *Sweet Brit. Fl. Gard.* t. 136. P. colorata, *Lehm. Ind. Sem. Hort. Hamb.* 1820. P. coccinea, *Hoffm. Briefaus Ind.* ii. App. 511. (Engl. edit.) P. Gulielmi Waldmeri, *Klotzsch in Reis. Pr. Waldem. Bot.* t. 13.

Western temperate Himalaya, alt. 5–9000 ft., from MURREE to KUMAON.

Stems erect, from a woody rootstock, 1–3-flowered, stout or slender, from densely villous to glabrate. *Radical leaves* 12 by 3 in.; leaflets sessile, 1–3 by $\frac{1}{4}$–$1\frac{1}{4}$ in., membranous, rarely acute, teeth obtuse or acute; base entire, cuneate; petiole slender; cauline stipules $\frac{3}{4}$–1 in., ovate or oblong, lower entire, upper lobed. *Flowers* $\frac{3}{4}$–1 in. diam; fruiting pedicels sometimes 3 in., divaricate. *Calyx-lobes* acute; bracteoles obtuse. *Achenes* very numerous, on a globose hairy receptacle.—In English gardens this species has been long cultivated and much hybridized.

28. **P. kashmirica,** *Hook. f.*; erect, leafy, clothed with spreading hairs, leaves short-petioled 5-foliolate, leaflets obovate-oblong very coarsely serrate lateral lobes softly hairy on both surfaces, flowers in large wide-spreading dichotomous cymes, petals obcordate yellow, achenes deeply wrinkled, style short subterminal.

KASHMIR at Nowgunge, alt. 7500 ft., *C. B. Clarke.*

Stem a foot high, rather slender; hairs soft, flexuous. *Leaves* 2–3 in.; leaflets 1–$1\frac{1}{2}$ in., sessile, the lateral much shorter and broader, all cut $\frac{1}{3}$ way down into subacute lobes or serratures, paler and almost silky beneath; petiole 1–2 in.; stipules lanceolate, acute. *Inflorescence* 6 in. diam., repeatedly forked and more corymbose than panicled, many-flowered. *Flowers* $\frac{1}{2}$ in. diam.; pedicels slender. *Calyx* silky; lobes ovate, acuminate; bracteoles obtuse. *Petals* about $\frac{1}{3}$ larger than the calyx. *Achenes* many, on a globose hairy receptacle.—A very distinct plant, allied to *P. nepa-*

lensis; distinguished by the shorter petioles, very deeply serrate shorter leaflets the lateral of which are lobed on the lower margin, by the yellow flowers and strongly wrinkled achenes; the broad corymbose inflorescence further distinguishes it from both *P. nepalensis* and *desertorum*. Its nearest ally is the European *P. hirta*, L. which has much larger flowers and achenes.

29. **P. argentea,** *Linn.*; *Boiss. Fl. Orient.* ii. 714; hoary with appressed white tomentum, stems leafy, leaflets 5 oblanceolate pinnatifidly cut into broad subacute teeth, base entire cuneate, flowers very numerous subcorymbose, pedicels slender, petals yellow, achenes minute smooth, style subterminal.

KASHMIR, *Jacquemont*; Pir Punjal, *Stewart*; Alibad, 8,000 ft., *C. B. Clarke*.—DISTRIB. Soongaria, N. Asia, Asia Minor westward to the Atlantic.

Stems many from the root, 6–10 in., erect or ascending. *Leaflets* 1–1½ in., sessile, rather stiff, lobes pointing upwards, margins slightly recurved, glabrous above; petiole 1–2 in.; stipules lanceolate, acuminate, entire. *Inflorescence* broad, much di-tri-chotomously branched, leafy. *Flowers* ⅓ in. diam.; pedicels ½–1½ in. *Calyx* densely tomentose; lobes acute; bracteoles entire. *Petals* rather exceeding the calyx, obovate. *Achenes* on a villous elevated receptacle.

30. **P. reptans,** *Linn.*; *Boiss. Fl. Orient.* ii. 723; glabrous, sparsely hairy, stolons long slender rooting, leaflets 5 obovate or oblanceolate crenate-serrate, peduncles axillary solitary naked 1-flowered, achenes many smooth, styles subterminal.

KASHMIR, *Falconer, Jacquemont, Thomson*.—DISTRIB. Siberia, Affghanistan westward to Abyssinia and in Europe to the Atlantic, N. China, Japan.

Rootstock woody; runners 1–2 ft., slender, leafy at the nodes. *Leaflets* 1–2 in., membranous, somewhat pedate, sometimes petiolulate; petiole 1–6 in., slender; stipules small, oblong, entire. *Peduncle* 1–4 in., erect. *Flowers* ½–¾ in. diam. *Calyx-lobes* broad or narrow, acute; bracteoles ovate, entire. *Petals* obcordate, yellow. *Achenes* dark brown.

VAR. *minor*; leaflets ⅓ in. rigid obovate quite glabrous.

VAR. ? *trifoliolata*; pubescent, leaflets 3 obovate sparingly silky beneath. Kashmir valley, *Thomson*.—Probably a different species.

31. **P. pteropoda,** *Royle Ill.* 207, t. 40, f. 2; silkily hairy, leaves long-petioled fan-shaped in outline, leaflets 5 cuneate-oblong toothed at the tip, stipules very long adnate to and almost equalling the petiole, stems 1- few-flowered, petals large, carpels ovoid. *Lehm. Revis. Potentill.* 157.

Mountains surrounding KASHMIR, *Royle* l. c.

This is the only described Indian *Potentilla* of which I have not seen a specimen. The above character is extracted from Royle's, to which the plate enables me to add that the flowering stems equal or rather exceed the leaves, and that the petals are obcordate and twice as large in the acute sepals. The drawing represents a plant with very much the habit of *P. curviseta*, but far more robust, with 3–5 much broader leaflets, that have rounded 5–7-toothed tips.

††† *Leaves digitately 3-foliolate (see also* 30. P. reptans, var. ? trifoliolata, *states of* 24. P. sericea *and* 23. multifida).

32. **P. argyrophylla,** *Wall. Cat.* 1020; tall, leafy, clothed with white silky hairs rarely with opaque tomentum, leaflets 3 elliptic-ovate -oblong -orbicular or obovate acutely toothed white beneath, nerves prominent, flowers many in panicled cymes usually long-pedicelled, petals large red purple or yellow, achenes smooth on a densely villous receptacle, style subterminal.

Western and Central Himalaya, from KASHMIR, alt. 8–13,000 ft. to NIPAL.

Rootstock very stout; stem 2–3 ft., finely pubescent. *Leaflets* 2–3 in., sessile or petiolulate, green, glabrous or finely silky above, dirty white beneath; nerves not very prominent, teeth acute; petiole 3–6 in.; cauline stipules ovate-oblong, acute. *Flowers* ¾–1¼ in. diam.; pedicels sometimes 2 in., and very slender. *Calyx* silky, lobes acuminate; bracteoles elliptic-oblong, obtuse acute or acuminate. *Petals* obcordate-cuneate, varying from red-purple to almost brown-purple. *Stamens* about 20, dark purple. *Achenes* very numerous; styles long.

Except in the colour of the petals I can find no difference between *P. atrosanguinea* and *P. argyrophylla*, and I am hence compelled to unite them; in so doing I retain the name of *argyrophylla* from its representing a character known to both forms.

VAR. *argyrophylla proper*; flowers yellow. P. argyrophylla, *Wall.; Lehm. Monogr. Potentill. Suppl.* t. 9; *Revis. Potentill.* 151. P. Jacquemontiana, *Canbess. in Jacq. Voy. Bot.* 51, t. 63. P. insignis, *Royle MSS.; Lindley in Bot. Reg.*, 1841, t. 37.—I have not seen the quinate leaflets which according to Lindley occasionally occur, nor the broad 2–3-fid bracteoles mentioned by Lehman.

VAR. *atrosanguinea*; flowers red or purple. P. atrosanguinea, *Lodd. Bot. Cab.* viii. t. 786; *Don Prodr.* 232; *Lehm. Revis. Potentill.* 150; *Hook. Bot. Mag.* t. 2689; *Sweet, Brit. Fl. Gard.* t. 124. P. Wallichiana, *Govan in Wall. Cat.* 1013.

VAR. *leucochroa*; much smaller, leaflets sometimes ½ in. densely silky often on both surfaces, flowering stems 1–few-flowered, flowers yellow or red. P. leucochroa, *Lindl. in Wall. Cat.* 1019. P. Cautleyana, *Royle Ill.* 207, t. 40, f. 1. P. cataclines, *Lehm. Pugill.* iii. 37; *Monog. Potentill. Suppl.* i. t. 10; *Revis. Potentill.* 150. P. vestita, *Klotzsch in Reis. Pr. Waldem. Bot.* t. 14.—Kashmir to Nipal, alt. 10–15,000 ft.—Lehman (Revis. 171) includes Lindley's *leucochroa* under the American *P. villosa*, which differs totally in the short style and glabrous receptacle.

33. **P. gelida,** *C. A. Meyer*; *Ledeb. Fl. Ross.* ii. 59; sparsely pubescent or silky or glandular, leaflets 3 small obovate or cuneate deeply crenate, cauline few much reduced with broad-ovate large entire stipules, flowering stems slender ascending, flowers on slender pedicels yellow, calyx-lobes acute longer than the oblong obtuse bracteoles, achenes smooth, styles subterminal, *Lehm. Revis. Potentill.* 154. P. grandiflora and P. alpestris, *Herb. Ind. Or. Hook. f. & T.*

Western temperate Himalaya; from KASHMIR to KUNAWUR and in WESTERN TIBET, alt. 13–17,000 ft.—DISTRIB. N. Asia from the Caucasus to Dahuria.

Usually covered with soft spreading hairs, sometimes glandular, rarely somewhat silky. *Rootstock* rarely large. *Leaflets* ⅓–¾ in. long, sessile or petiolulate, usually entire for ½ or ⅓ upwards from the base, crenatures very large, sometimes only 4 or 6, and towards the very end of the leaflet, rather membranous, flat, nerves indistinct; petiole ½–1, rarely 2 in.; stipules of cauline leaves ¼–⅓ in. long, hoary. *Flowers* ½–1 in. diam., usually 1–4 on slender pedicels. *Calyx* pubescent or silky. *Petals* obcordate. *Achenes* many on an elevated villous receptacle.—A very variable plant. Some specimens of Mr. Clarke's from Karakoram, alt. 14,500 ft. are upwards of 2 feet high, others from Kumaon are not as many inches and are quite glutinous. The broad entire stipules and almost naked flowering stems are its best character. I do not see how it is to be distinguished from the European *P. grandiflora* and Siberian *P. fragiformis*, Willd. (exclusive of the Japan plant so called by A. Gay).

34. **P. doubjouneana,** *Camb. in Jacq. Voy. Bot.* 50, t. 61; sparsely pubescent, leaflets 3 obovate-cuneate deeply toothed, cauline with obcuneate toothed stipules, flowering stems ascending slender leafy, calyx-lobes acute longer than the obcuneate 3-fid bracteoles, achenes smooth, style subterminal. *Lehm. Revis. Potentill.* 157.

KASHMIR, alt. 9–10,000 ft., *Jacquemont, Thomson.*

Very similar to *P. gelida*, but distinguished by the more leafy flowering stems,

the obcuneate cut stipules and trifid bracteoles. It appears to be a very scarce plant, and I regret to find Thomson's specimens have been by me mixed in the distribution with those of *P. gelida*, under the name of *P. grandiflora.*

35. **P. monanthes,** *Lindl. in Wall. Cat.* 1025; glandular or sparsely pubescent, leaflets 3 broadly obcuneate coarsely crenate at the apex, cauline stipules broad-ovate acute, flowering stems very many ascending leafy, flowers sessile and pedicelled at the top of the stem, calyx-lobes broad obtuse, bracteoles orbicular-oblong, achenes minute smooth, style terminal. *Lehm. Revis. Potentill.* 175. P. cryptantha, *Klotzsch in Reis. Pr. Waldem. Bot.* t. 12.

Alpine Himalaya; from KASHMIR to SIKKIM, alt. 10,000 to 15,000 ft.

Forming large spreading tufts of leaves and stems 2–12 in. high from a rather small rootstock, very variable in size. *Leaves* radical and cauline, all short petioled; leaflets $\frac{1}{6}$–$\frac{2}{3}$ in., rather soft, glandular-pubescent on both surfaces, crenatures rounded; petiole rarely 1 in.; stipules $\frac{1}{4}$–$\frac{1}{2}$ in., rarely cut. *Flowers* $\frac{1}{3}$–$\frac{1}{2}$ in. diam., axillary and subterminal, shortly pedicelled. *Calyx* pubescent, hemispheric; bracteoles often larger than the lobes. *Petals* obovate-orbicular, not much exceeding the calyx, yellow. *Achenes* exceedingly numerous and minute, on a globose villous receptacle.—The rounded tips of the sepals and bracteoles are good characters of this species. The Potentilla 26 of Strachey and Winterbottom from 12,000 ft. in Kumaon is, I think, a minute state.

VAR. *sibthorpioides*; much smaller, stems filiform prostrate, leaflets $\frac{1}{8}$–$\frac{1}{4}$ in. broader, flowers $\frac{1}{4}$ in. diam., calyx-lobes and bracteoles narrower.—Lachen valley, Sikkim, alt. 11–13,000 ft., *J. D. H.*

36. **P. curviseta,** *Hook. f.*; rigid, thinly silky, leaflets 3 narrowly linear-cuneate truncate and trifid at the tip, stipules forming a narrow wing to the petiole for half its length, flowering stems slender, pedicels filiform decurved, achenes 5–6 hairy, style terminal.

KASHMIR; at Tilail, alt. 12,000 ft., *C. B. Clarke.*

Whole plant rigidly elastic when dry. *Rootstock* slender, crowned with stiff recurved almost woody leaf bases. *Leaves* few, 2–3 in. long; leaflets $\frac{1}{2}$–1 by $\frac{1}{5}$–$\frac{1}{3}$ in., suberect, coriaceous, hairy on both surfaces, teeth acute, the lateral leaflets with sometimes an additional tooth on the outer margin; petiole rigid, with a rather membranous brown sheath formed by the stipules which above the base form a green narrow margin along the petiole to its middle; free parts of stipules small, subulate, entire. *Flowering stems* 2–3 in., 2–3-flowered, slender, wiry, with opposite linear bracts at the middle and a cut one at the giving off of the pedicels; pedicels circinnately incurved after flowering, naked or with a bract at the middle. *Calyx* $\frac{1}{4}$ in. diam., silky; lobes lanceolate, acuminate, much larger than the oblong bracteoles. *Stamens* and carpels about 20. *Achenes* few, large, obliquely ovoid; receptacle flat, villous.—A very remarkable species, allied to *P. tridentata*, L., *P. Saxifraga*, Ard., and *P. alba*, L. The only Himalayan one with hairy carpels. Still more near to the *P. pteropoda*, Royle, which has 3–5 much broader more toothed leaflets rounded at the tip, and apparently larger flowers. I have seen no petals.

37. **P. nivea,** *Linn.*; *Boiss. Flor. Orient.* ii. 725; dwarf, densely clothed with white appressed tomentum, leaflets 3 rarely 5 small obovate acutely serrate, flowering stem 1–3-flowered, calyx villous, petals obcordate, achenes several smooth and faintly wrinkled, style terminal. *Lehm. Revis. Potentill.* 165. P. cæspitosa, *Lehm. Add. Ind. Sem. Hort. Hamb.* 1849, 10; *Revis. Potentill.* 172, t. 53. P. argyrophylla, *var.* prostrata, *Herb. Ind. Or. Hook. f. & T.*

WESTERN TIBET and drier Alpine regions of the whole Himalaya, alt. 10–17,000 ft. —DISTRIB. Caucasus and westwards to the Alps, Arctic and cold regions of N. Europe, Asia and America.

A small high Alpine species, very difficult in some of its forms to distinguish from dwarf states of *P. multifida* on the one hand, and but for the smaller flowers, from *P. leucochroa* on the other, which again resembles closely *P. argyrophylla* of the Himalayas and *P. villosa* of Arctic America.—*Rootstock* very stout and woody. *Leaves* 1–2 in.; leaflets ¼–1 in., sessile, very coriaceous, glabrous or silky above, snow-white beneath; petiole stout; stipules ovate, acute, downy, entire or toothed. *Stem* with 1 (rarely more) reduced leaf. *Flowers* ½ in. diam., on stout peduncles. *Calyx* woolly; lobes acute; bracteoles oblong, obtuse. *Petals* yellow, obcordate. *Achenes* few, pale, tumid, on a densely woolly low receptacle.

** Root annual.

38. **P. Kleiniana,** *Wight & Arn. Prodr.* 300; sparsely silkily hairy, stems many from the root very slender prostrate leafy, leaves digitately 3–5-foliolate, leaflets 5 narrowly obovate or oblanceolate obtuse obtusely serrate, stipules ½-lanceolate, flowers small in terminal panicled cymes, achenes minute deeply wrinkled, style terminal. *Wight. Ill.* t. 85; *Lehm. Revis. Potentill.* 79. P. Wallichiana, *Wall. Cat.* 1022; *Lehm. Rev. Potentill.* 80, t. 34, *not of DC. Prodr.* P. gracilis, *Wall. MSS.* Duchesnea sundaica, *Miq. Fl. Ind. Bat.* i. part 1, 372, t. 6.

Temperate Himalaya from KASHMIR, alt. 3–7000 ft., to SIKKIM, alt. 4–9000 ft. and BHOTAN. KHASIA MTS., alt 4000 ft. NILGHIRI MTS., alt. 6–7000 ft. CEYLON, central province, alt. 6–7000 ft.—DISTRIB. Yunan, Java, Japan.

Annual. *Stems* 3–24 in., flexuous. *Leaflets* ½–2 in., variable in breadth, membranous or rather coriaceous, entire towards the cuneate base, flat or complicate, beneath glabrous or with silky hairs on the nerves; petiole very slender, 1–4 in.; stipules ½ in., entire or toothed. *Flowers* ¼ in. diam., usually pedicelled, or in spreading cymes. *Calyx* sparsely silky; lobes entire; bracteoles acute or obtuse. *Petals* yellow, not much exceeding the calyx. *Achenes* in a globose head with a large glabrous receptacle.—Leaflets very rarely 7, sometimes pedate.

39. **P. supina,** *Linn.*; *Boiss. Fl. Orient.* ii. 725; annual, hairy, stems spreading leafy, leaves pinnate, leaflets 3–9 opposite and alternate oblong obtuse lobulate or serrate, stipules ovate entire, pedicels axillary solitary, petals small, achenes minute, styles subterminal. *Wight & Arn. Prodr.* 300; *Lehm. Revis. Potentill.* 193. P. cicutariæfolia, *Willd.* P. denticulata, *Ser.*; *Wall. Cat.* 1029. P. Heynii, *Roth*; *Wall. Cat.* 1024. P. cana, *Wall. MSS.* P. ruthenia? *Herb. Ham.* P. amurensis, *Maxim.* P. obovata, *Bertol. Piant. Nuov. Asiat.* 8, t. 4. Comarum flavum, *Roxb. Cat. Hort. Beng.* 39; *Fl. Ind.* ii. 521.

Throughout the warmer parts of India, from KASHMIR to MALACCA and the NILGHIRI HILLS; ascending the Himalaya to 8500 ft. in the north-west. Iskardo in WESTERN TIBET., alt. 7–8500 ft.—DISTRIB. Affghanistan and westward to the Atlantic, N. Asia and N. Africa.

Stems very numerous from the root, 6–18 in., spreading, dichotomously branched, prostrate or suberect, stout or slender. *Leaves* ½–3 in., flaccidly membranous; leaflets irregular in position form and cutting, usually obovate, often oblong or cuneate, obtusely crenate incised or serrate; petiole slender, ½–2 in.; stipules very broad or narrow. *Flowers* ¼–⅓ in. diam.; pedicels ⅙–½ in., slender. *Calyx-lobes* obtuse or acute, as are the bracteoles. *Petals* oblong, yellow, smaller than the calyx. *Achenes* very many, minute, smooth or ridged; receptacle globose, villous.—There are two extreme forms of this common plant both found everywhere in Asia and in Africa, and many intermediates; it appears to be very rare in the Western Peninsula absent from Ceylon, which is remarkable for a tropical and subtropical annual that extends to Malacca.

VAR. 1; stems excessively numerous from the root slender, flowers ¼ in. diam., achenes minute smooth. *Plains of India.*

VAR. 2; stems more robust more dichotomously branched, flowers ½ in. diam., achenes larger ribbed. *Kashmir.*

DOUBTFUL AND UNDETERMINABLE SPECIES.

POTENTILLA *sp.* from Shillong, Khasia Mts., alt. 5,000 ft., *C. B. Clarke*; perennial, sparsely hairy, leaflets 3 sessile ½–1¼ in. elliptic-ovate or obovate acutely toothed hairy beneath less so above, cauline stipules small cut, flowering stem inclined or prostrate slender 2–3-leaved, cymes corymbose rusty tomentose leafy flowers ⅝ in. diam., calyx-lobes lanceolate acute, bracteoles elliptic obtuse, petals obcordate twice as long as the calyx, carpels many.

POTENTILLA *Candolleana, Royle Ill.* 203, *name only.*

POTENTILLA *Atropos* and *pteropoda* are names given without description or indication of affinity in Hofmeister's travels, and are no doubt described Himalayan plants.

12. CHAMÆRHODOS, *Bunge.*

Herbs with a woody rootstock, and ascending or erect leafy stems. *Leaves* alternate, divided; stipules membranous, adnate to the petiole. *Flowers* small, 5-merous, in branched cymes. *Calyx* persistent, tube ebracteolate; lobes erect, valvate. *Petals* 5, equalling or exceeding the calyx. *Stamens* 5, opposite the calyx-lobes, short. *Disk* lining the base of the calyx; its margins free, bristly. *Carpels* 5, 10, or more, sessile in the base of the calyx; style basilar, deciduous; ovule 1, ascending. *Achenes* few or many, dry, glabrous.—DISTRIB. Mountains of Northern Asia and N. America; species 4 or 5.

1. **C. sabulosa,** *Bunge*; *Ledeb. Flor. Ross.* ii. 35; *Ic.* t. 257; tufted, glandular and villous; leaves 3-partite, segments narrow lobed obtuse.

WESTERN TIBET, alt. 12–15,000 ft.—DISTRIB. Altai Mts.

Rootstock short, with many densely tufted short heads. *Stems* 2–4 in., slender, erect or ascending, branched, naked or leafy. *Leaves* with the slender petiole ½ in. *Flowers* ⅛ in. diam., yellow. *Achenes* smooth, ovoid, narrowed upwards.

13. ALCHEMILLA, *Linn.* Lady's mantle.

Annual or perennial herbs. *Leaves* orbicular, lobed or deeply divided; stipules adnate to the petiole. *Flowers* minute, in lax or crowded corymbose cymes. *Calyx* urceolate, persistent, 4–5-bracteolate; lobes 4–5, valvate in bud. *Petals* 0. *Stamens* 1–4, inserted on the mouth of the calyx. *Disk* coating the calyx-tube, and all but closing its mouth by its thickened margin. *Carpels* 1–5, basal in the calyx-tube; style basal or ventral; ovule 1, basal. *Achenes* 1–4, enclosed in the membranous calyx-tube.—DISTRIB. Natives chiefly of the American Andes; a few are European, N. Indian, and American; species 30.

1. **A. vulgaris,** *Linn.*; *Boiss. Fl. Orient.* ii. 729; leaves plaited orbicular-cordate 7–9-lobed toothed, stipules confluent into a funnel-shaped tube with short broad spreading toothed lips.

KASHMIR, alt. 8–9000 ft., *Falconer, Stewart, C. B. Clarke*—DISTRIB. Persia and westward to the Atlantic, N. Europe and Asia, Greenland and Labrador.

More or less clothed with silky hairs. *Rootstock* perennial, creeping. *Stems* 6–18 in., ascending, simple. *Radical leaves* 2–3 in. diam., basal lobes overlapping; petiole 6–18 in.; stipules usually spreading out like a fan. *Cymes* glabrous, irregularly racemed or panicled. *Flowers* ⅛ in. diam., yellow-green: pedicel very short. *Achenes* 1–2.

2. **A. indica,** *Gard. in Calc. Journ. Nat. Hist.* viii. 8; villous with soft long spreading hairs, leaves orbicular-cordate 5–7-lobed minutely toothed, stipules confluent in a cylindric tube with oblong entire or toothed acute lips. A vulgaris, *Wight Ic.* t. 229. A. vulgaris *var.* sarmentosa, *Thwaites Enum.* 102. A. ceylanica, *Moon Cat. Pl. Ceyl.* 37.

NILGHIRI MTS., *Wight* &c. CEYLON; Central Province, alt. 5–7000 ft.
Rootstock creeping, woody. *Stems* prostrate, stout, leafy. *Leaves* 1–2 in. diam., glabrous or silky above, margins silky, coriaceous, basal lobes overlapping or not; petiole 1–10 in.; stipules $\frac{1}{4}$–1 in., the free portion membranous, erect or spreading, ciliate. *Cymes* globose, dense-flowered, on slender axillary peduncles 1–2 in. long. *Calyx* villous, $\frac{1}{10}$ in. long or less.
VAR. *sibthorpioides*; very slender, leaves $\frac{1}{2}$–$\frac{2}{3}$ in. diam., cymes panicled.—Ceylon, *Gardner.*

14. AGRIMONIA, *Linn.* Agrimony.

Slender erect leafy perennial herbs. *Leaves* interruptedly pinnate; leaflets coarsely serrate; stipules partially adnate to the petiole. *Flowers* small, yellow, in terminal spikelike racemes, 2-bracteolate; pedicels bracteate at the base. *Calyx* persistent; tube turbinate, spinous; mouth contracted; lobes 5, triangular, imbricate. *Petals* 5. *Stamens* 5–10 or more, inserted at the mouth of the calyx. *Disk* lining the calyx-tube, its margin thickened. *Carpels* 2, included in the calyx-tube; styles exserted, stigma 2-lobed; ovule 1, pendulous. *Fruit* pendulous, of 1 or 2 achenes enclosed in the hardened spinous calyx.—DISTRIB. N. temp. regions, and S. America; species 8.

1. **A. Eupatorium,** *Linn.*; *Boiss. Fl. Orient.* ii. 727; hairy or villous, leaflets elliptic-ovate or lanceolate acute obtuse or acuminate, coarsely obtusely serrate, bracts slender, calyx-tube villous deeply grooved, outer spines spreading. A. lanata, *Wall. Cat.* 709; *Wallroth Beiträg. Bot.* 1. 54, t. 1, f. 9. A. nepalensis, *Don Prodr.* 229; *Camb. in Jacq. Voy. Bot.* 55, t. 68.

Temperate Himalayas, from MURREE and KASHMIR, alt. 3–10,000 to SIKKIM, alt. 7–10,000 ft. KHASIA MTS., alt. 4–6000 ft. MISHMI Hills, *Griffith.*—DISTRIB. Westwards from Persia to the Atlantic, Siberia and Java, N. America, Java?
Rootstock woody, short or long. *Leaves* 3–7 in.; leaflets 6–21, sessile, alternate often small, hairy on both surfaces; larger 1–3 in., elliptic-ovate or -obovate rarely orbicular; smaller often orbicular and minute; petiole slender; stipules large, leafy, $\frac{1}{2}$-lunate, entire or toothed. *Racemes* slender, lengthening in fruit; pedicels reflexed in fruit; bracts 3-fid or 3-partite. *Flowers* $\frac{1}{4}$ in. diam. *Petals* oblong-obovate, yellow. *Calyx-tube* $\frac{1}{3}$ in., hardened in fruit, grooved, lobes conniving in fruit; top of tube with a dense ring of spines which become hooked in fruit and are erect with the outer spreading.—I am quite unable to correlate the India form of this plant with the characters given for the European species so called; all are more or less glandular and have a deeply furrowed calyx-tube and a horizontal rootstock.—*A. javanica,* Miq. seems not different as far as a single specimen enables me to judge.

2. **A. pilosa,** *Ledeb.*; *Fl. Ross.* ii. 32; sparsely hairy, leaflets elliptic-ovate -obovate or -lanceolate obtuse or acute coarsely obtusely serrate, bracts slender, calyx-tube almost glabrous deeply grooved spines all erect. A. viscidula, *Bunge Mem. Sav. Etr. St. Petersb.* ii. 100, *ex Walp. Rep.* ii. 41.

KASHMIR to KUNAWUR, alt. 6–8000 ft., *Thomson, C. B. Clarke.*—DISTRIB. Russia to Manchuria, China and Japan.
Very similar to *A. Eupatorium,* but more glabrous than its Indian forms, and calyx almost glabrous with erect spines.—I do not see how *A. viscidula* differs.

3. **A. zeylanica,** *Moon Cat.* 37; villous with long spreading hairs, leaflets nearly orbicular coarsely obtusely toothed, lower bracts broad leafy, calyx-tube villous deeply grooved, spines spreading. A. Eupatorium, *Thwaites Enum.* 102; *Wight Ic.* t. 224.

CEYLON, central province, at an elevation of 5–7000 ft.

I keep up this species with great hesitation, suspecting it to be only a tropical form of *A. Eupatorium,* and there being approaches to it amongst the Sikkim and Khasia specimens of that plant; it is however far more unlike than these to any European form in the villous pubescence, short leaves and rounded leaflets. It is further remarkable that neither this nor any other *Agrimonia* should be found in the Western Peninsular mountains of the Indian continent.

15. POTERIUM, *Linn.*

Erect perennial herbs. *Leaves* pinnate; leaflets stalked; stipules adnate to the sheathing petiole. *Flowers* small, subsessile, in dense long-peduncled heads or centrifugal spikes, bracteate, 2-bracteolate, often polygamous. *Calyx-tube* persistent, turbinate, mouth contracted; lobes 4, petaloid, deciduous, imbricate. *Petals* 0. *Stamens* 4 or more, inserted at the mouth of the calyx, filaments slender pendulous. *Disk* lining the calyx-tube and closing its mouth. *Carpels* 1–3, enclosed in the calyx-tube; styles filiform, stigma penicillate; ovule 1, pendulous. *Achenes* solitary, enclosed in the hardened 4-angled often winged or muricate calyx-tube.—DISTRIB. N. temp. regions; species 20.

* *Carpels solitary.*

7064 1. **P. filiforme,** *Hook. f.*; glabrous, very small and slender, leaflets sessile ovate-orbicular or -cuneate deeply toothed, peduncle subradical very long and slender, heads globose white, stamens 6.

SIKKIM HIMALAYA; in marshy ground, Lachen valleys, alt. 11,500 ft., *J. D. H.*

A small and very delicate plant quite unlike its congeners in habit; the stems being short and the heads on very long 6–8 in. filiform peduncles, each with a minute reduced leaf and bud about the middle. *Stems* tufted, ascending. *Leaves* 1–3 in.; leaflets 3–5 pair, $\frac{1}{4}$ in. broad. *Heads* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., quite white; bracts orbicular or oblong, membranous, glabrous; flowers monœcious. *Calyx-tube* ellipsoid. *Style* very slender, stigma capitate.

7065 2. **P. diandrum,** *Wall. Cat.* 710 (Sanguisorba); tall, quite glabrous, leaflets petiolulate oblong-cordate crenate-toothed, heads globose, stamens 2, fruit oblong deeply 4-winged.

Temperate Central and Eastern Himalaya; NIPAL, *Wallich.* SIKKIM, alt. 10–13,000 ft., *J. D. H.*

Stem erect, 2–3 ft., branched above. *Leaves* 6–10 in.; leaflets $\frac{1}{2}$–1 in., opposite or alternate, membranous, often complicate when dry, crenatures or teeth variable, acute or obtuse. *Heads* $\frac{1}{2}$–$\frac{3}{4}$ in. diam., on slender erect axillary peduncles; bracteoles oblong, fimbriate. *Flowers* dark-purple, hermaphrodite (polygamous?). *Calyx-tube* ellipsoid, 4-gonous, glabrous; segments orbicular, concave, 3-nerved. *Style* short, stigma large plumose. *Fruit* pendulous, $\frac{1}{4}$ in. long, smooth between the undulate wings.

3. **P. indicum,** *Gardn. in Calc. Journ. Nat. Hist.* viii. 10; tall, base of stem and petioles clothed with rusty hairs, leaflets petiolulate orbicular or cordate-ovate with few large teeth, heads globose, fruit trapezoid. *Thwaites Enum.* 102.

CEYLON, *Sir J. G. McKenzie*; Adam's Peak, *Alwis*.

Very similar to *P. diandrum* in stature, habit. foliage, &c., but leaflets with fewer teeth, petiole and midrib of leaflets underneath with flexuous hairs; bracteoles orbicular, clawed, ciliate; calyx segments slightly hairy or scabrid on the back; fruit $\frac{7}{16}$ in., trapezoid, with short wings and a bony endocarp. The flowers are probably polygamous; I find 12 imperfect ones in one bud, and fewer perfect, but my materials are very insufficient.—This is a very little known plant, the only specimen I have seen is Sir J. McKenzie's (in Herb. Benth.). Gardner described it from some found by Mr. Alwis. Dr. Thwaites says that he has searched for it in vain. Like *Agrimonia*, the genus is unknown in the Indian Western Peninsula.

4. **P. longifolia,** *Bertol. Misc. Dec.* xxii. 14, t. 1 (SANGUISORBA); tall, glabrous, leaflets petiolulate linear-oblong crenate with often accessory leaflets at the base of the petiolules, heads cylindric, stamens 4, fruit short 4-winged.

KHASIA MTS., alt. 5–6000 ft., *Griffith*, &c.

Rootstock creeping, stout. *Stem* 2–4 ft., strict, much branched above. *Leaves* 10–16 in.; leaflets 1–3 in., rigid, base subcordate oblique, under surface reticulate; petiole stiff, erect; stipules very variable, of radical leaves subulate, of cauline foliaceous fan-shaped and toothed or produced and pinnate, tip rounded. *Heads* 1–2½ in., panicled, on slender stiff peduncles. *Flowers* purple, hermaphrodite; bracteoles oblong, fimbriate. *Calyx-tube* ellipsoid, 4-angled, compressed, pubescent, segments in opposite pairs of which one is broader than the other, thick, and thickened towards the tip which is notched with a mucro in the notch and 3-nerved, back with a few hairs. *Stamens* with slender filaments. *Style* filiform, elongate, stigma capitate. *Fruit* broader than long, $\frac{1}{10}$ in. long, wings membranous.

** *Carpels* 2.

5. **P. Sanguisorba,** *Linn.*; *Boiss. Fl. Orient.* ii. 733; sparsely hairy, leaflets petiolulate orbicular deeply toothed, heads globose, stamens about 20, fruit trapezoid acute at both ends.

WAZURISTAN (N. W. of the Punjab), alt. 5–8000 ft., *Stewart*.—DISTRIB. Persia and westward to the Atlantic, N. Asia.

Stems suberect or ascending, leafy, with lax flaccid hairs. *Leaves* 3–6 in.; leaflets opposite or alternate, $\frac{1}{3}$–$\frac{2}{3}$ in., membranous, base rounded, petiolules very short; petiole slender. *Heads* panicled.—I have seen flowering specimens only, which seem not to differ in any particular from the European plant.

16. ROSA, Linn.

Erect, sarmentose or climbing shrubs, usually prickly. *Leaves* pinnate; leaflets serrate; stipules adnate to the petiole. *Flowers* terminal, solitary or corymbose, white yellow or red, bracts rarely persistent. *Calyx-tube* persistent, globose ovoid or pitcher-shaped; mouth contracted; lobes leafy, imbricate in bud. *Petals* 5, large. *Stamens* many, inserted on the disk. *Disk* coating the calyx-tube, all but closing its mouth by its thickened margin, silky. *Carpels* many, rarely few, in the bottom of the calyx-tube; styles subterminal, free or connate above, stigma thickened; ovule 1, pendulous. *Achenes* coriaceous or bony, enclosed in the fleshy calyx-tube.—DISTRIB. N. temp. regions, rare in America; extending into Abyssinia, India, and Mexico; species, about 30 very distinct forms with innumerable subspecies and varieties.

The following roses are so commonly cultivated by the natives of India, that I think it right to give a synopsis of them taken from Brandis' "Forest Flora," 199.

A. *Styles distinct.*

I. Bracteatæ. Fruit and branchlets densely tomentose; prickles twin, mostly infra-stipular; flowers bracteate; sepals deciduous.

1. R. Lyellii, (including *R. involucrata*). See below.
2. R. bracteata, *Wendl.*; flowers large white, calyx-tube clothed with prickles. —The Macartney rose. China.

II. Eglanteria, Prickles some stout and some slender; flowers yellow or red; sepals persistent.

3. R. Eglanteria, *Mill.* See below.
4. R. sulphurea, *Ait.*; leaflets 7 whitish beneath, flowers large yellow double. R. Rapini, *Boiss. Fl. Orient.* ii. 672. Asia Minor to Persia.

III. Gallicæ; erect, prickles mixed with glandular bristles; leaflets rugose; flowers rosy or purple; sepals more or less pinnatifid.

5. R. damascena, *Mill.; Wall. Cat.* 684; pickles unequal, larger hooked, sepals reflexed in flower.—The commonest Indian garden rose; cultivated for Attar. Native country unknown.
6. R. centifolia, *Linn.*; *Roxb. Fl. Ind.* ii. 513; prickles unequal large hooked, bristles numerous, leaflets and calyx glandular-ciliate, flowers nodding.—The Cabbage, Moss, and Provence roses.—Caucasus and Assyria.
7. R. Gallica, *Linn.*; prickles slender equal, flowers erect.—Europe, Asia Minor.

IV. Caninæ. Prickles uniform; bristles 0; flowers purple red, rosy or white.

8. R. indica, *Linn.*; *Wall. Cat.* 85, 685; evergreen, glabrous, stipules very narrow adnate almost to the top, flowers large on long pedicels rarely single, sepals reflexed. R. chinensis, *Jacq.; Roxb. Fl. Ind.* ii. 513. R. sinica, *Linn.* R. fragrans, *Redouté*; R. semperflorens, *Bot. Mag.* t. 284; *Roxb. Fl. Ind.* ii. 514; *Wall. Cat.* 686.—The Indian, China, Bengal and Tea roses, and hybrid perpetuals belong here. China.
9. R. microphylla, *Lindl. Bot. Reg.* t. 919; *Roxb. Fl. Ind.* ii. 515; *Bot. Mag.* t. 3490; *Wall. Cat.* 692; branchlets flexuous, prickles infra-stipular, leaflets 9–15 small, scape densely prickly, sepals short broad-toothed, flowers large double rosy.—China.
10. R. alba, *Linn.*; leaflets 5–7 large grey rugose downy and pale beneath, flowers large white pale or blush double, sepals often pinnatifid. R. glandulifera, *Roxb. Fl. Ind.* ii. 514.—Caucasus, Affghanistan?

V. Banksianæ. Climbing; stipules small, often deciduous; flowers rather small, corymbose.

11. R. Banksiæ, *Br.*; unarmed, leaflets 3 or 5 shining, flowers white or yellow. *Bot. Mag.* t. 1954; *Bot. Reg.* t. 1105. R. inermis, *Roxb. Fl. Ind.* ii. 516.—China, Japan.
12. R. microcarpa, *Lindl.*; prickles hooked, leaflets usually 3 shining, flowers white, sepals deciduous, fruit small globose red.—China.
13. R. sinica, *Ait.*; *Bot. Mag.* t. 2847; *Bot. Reg.* t. 1922; *Wall. Cat.* 694; prickles red hooked, leaflets 3 shining, flowers solitary large white, peduncles and calyx clothed with straight prickles, fruit muricate crowned with the spreading sepals. R. triphylla, *Roxb. Fl. Ind.* ii. 515.—China, Japan.
14. R. Fortuneana, *Lindl.*; prickles small hooked, leaflets 3 or 5 dark shining, flowers solitary white double, peduncles short bristly, calyx naked and glabrous.—China.

B. *Styles united in a column; flowers corymbose; prickles uniform.*

15. R. moschata. See below.
16. R. sempervirens. See below.
17. R. multiflora, *Thunb.; Bot. Mag.* t. 1059; *Bot. Reg.* t. 425; stipules and bracts pectinate; flowers double rosy; petioles and inflorescence with long soft hairs and no glands; sepals broad ovate.—Japan, China.

SECT. I. *Styles* distinct.

* *Sepals deciduous in fruit.*

1. **R. involucrata,** *Roxb. Hort. Beng.* 38; *Fl. Ind.* ii. 513; branchlets and inflorescence densely tomentose, prickles straight, flowers shortly pedicelled, bracts large lanceolate, calyx-tube unarmed. *Don Prodr.* 235; *Bot. Reg.* t. 739; *Wight Ic.* t. 234; *Kurz For. Flor. Brit. Burm.* i. 440; *Wall. Cat.* 696; *Crepin. in Bull. Soc. Bot. Belg.* xiv. 140. R. Lyellii, *Lindl. Monogr. Ros.* 12, t. 1; *Crepin l. c.* 143. R. Lindleyana, *Tratinik Ros.* i. 190. R. palustris, *Buch. MSS.* R. multiflora, *Herb. Ham.*

By the sides of streams of the GANGETIC PLAIN. Westward to Mt. Aboo in MARWAR and eastward to BIRMA and along the lower Himalaya from KUMAON eastwards. MYSORE, *Munro.*

A stout bush, erect or with arching subscandent branches; prickles often in stipular pairs, compressed. *Leaves* 3–4 in.; leaflets 3–4 pair, 1½ in. and less, elliptic or oblong, acute or acuminate, finely serrate, shining above, glabrous on both surfaces or tomentose on the under; stipules small laciniate. *Flowers* 2–3 in. diam., white, fragrant, solitary or in short corymbs, rarely axillary and longer pedicelled; peduncles and pedicels sometimes with glandular hairs; bracts more or less glandular-serrate, especially below. *Calyx-tube* obovoid; lobes caudate-acuminate, quite entire, deciduous. *Petals* retuse. *Fruit* globose, densely tomentose; mass of stigmas discoid, exserted; achenes very many, ⅙ in. long. pale.—Except that one is described as scandent I cannot distinguish *R. involucrata* from *R. Lyellii.* It is the common rose of the Bengal plains and foot of the Himalaya and the only really tropical species of India. Lindley's varieties *burmana, parvifolia, glabra,* and *acutifolia* (in *Wall. Herb.*) explain themselves. Wallich's specimen of *involucrata* var. *glabra* is stated to come from the mountains of Pundua on the confines of Sylhet, *i. e.* the Khasia Mts., which I greatly doubt, for I found it in the Jheels only of Sylhet; and Blinkworth's habitat of the Alps of Sirinuggur probably applies to the Dheyra dhoon. Wallich who procured *R. Lyellii* in Nipal describes it as a large climber in woods, possibly confounding it with *R. moschata.* Crepin hazards the conjecture that *Lyellii* is a hybrid between *involucrata* and *moschata,* and regards it as a very doubtful plant, under which circumstances I have retained Roxburgh's name of *involucrata,* which first appeared in his "Cat. Hort. Bot. Calc." in 1814.

2. **R. anserinæfolia,** *Boiss. Fl. Orient.* ii. 677; tall, subscandent, prickles hooked, bristles 0, leaflets broadly elliptic obtuse simply serrate and petioles pubescent beneath or on both surfaces, flowers in few- or many-flowered corymbs shortly pedicelled white, fruit very small globose.

WUZURISTAN; alt. 5,000 ft., *Dr. Stewart.* — DISTRIB. Affghanistan and Beluchistan.

This is a common wild and cultivated Affghan rose, ascending to 10,000 ft., of which Griffith gathered many specimens, and which no doubt extends within the British frontier, though the nearest hitherto detected habitat is that given above, whence the specimens have very small foliage and flowers.—A shrub often 10 ft.; branches with few or many unequal stout compressed prickles often in pairs; branchlets leaves beneath petioles and calyx covered usually with a rather furfuraceous pubescence mixed on the petioles and calyx with minute prickles and glands. *Leaves* 1–3 in.; leaflets ⅓–⅔ in., rarely glabrous above, sessile, nerves beneath indistinct; petiole slender; stipules broad, with glandular ovate free portion. *Flowers* from solitary to many in a short crowded corymb, ¾–1½ in. diam., fragrant; pedicels short, glabrous or pubescent; bracts ovate-lanceolate, densely glandular. *Calyx tube* globose, usually smooth and glabrous; lobes ovate-lanceolate, caudate-acuminate, tomentose, deciduous; tips pubescent, sometimes dilated. *Fruit* smooth, ¼ in. diam.; head of stigmas very large; achenes ⅙–⅛ in. long.—The above description is of the ordinary state of the plant. Stewart's specimens have more obovate green leaflets ⅓ in. long, faintly puberulous beneath, and solitary flowers barely 1 in. diam.

** *Sepals persistent in fruit.*

3. **R. macrophylla,** *Lindl. Monogr. Ros.* 35, t. 6; prickles straight or 0, glandular and pubescent or not, leaflets elliptic-ovate acuminate or acute finely serrate, bracts large, flowers solitary or corymbose red, sepals very long tips filiform often dilated and serrate. *Brandis For. Flor.* 203; *Wall. Plant. As. Rar.* ii. 19, t. 117; *Cat.* 690; *Don Prodr.* 235; *Crepin in Bull. Soc. Bot. Belg.* xiii. 284, xiv. 167. R. Hoffmeisteri *and* Gulielmi Waldemarii, *Klotzsch in Reis. Pr. Waldem. Bot.* 153, t. 7, 8. R. Hookeriana, *Bertol. Misc. Bot.* xxiv. 14, t. 1.

Temperate Himalaya, from MURREE, alt. 3500–10,000 ft. to SIKKIM, alt. 8–10,000 ft.—DISTRIB. China.

Erect; prickles straight or slightly curved, with broad dilated bases. *Leaves* 2–8 in.; leaflets ½–2 in., usually pubescent beneath, base acute rarely rounded; petiole pubescent; stipules large, broad, spreading. *Flowers* 1–3½ in. diam., bright red, peduncles pedicels and calyx usually very bristly and glandular; bracts foliaceous, oblong or lanceolate, glandular on the margin. *Calyx-tube* ½–1½ in.; lobes 1–2 in., persistent. *Petals* broadly obcordate. *Fruit* sometimes 2 in. long; styles hairy, exserted; achenes large, often ⅓ in. long, few or many.

VAR. *minor*, Lindl. l. c.; leaflets ½ in. often obtuse, flowers 1–1½ in. diam.

VAR. *Hookeriana*; nearly unarmed, leaves very pubescent, peduncles and calyx hardly glandular. R. Hookeriana, *Wall. Cat.* 691, *not of Bertol.* R. torulosa, *Wall. MSS.*

4. **R. Eglanteria,** *Linn.*; *DC. Prodr.* ii. 607; erect, branches with straight prickles, branchlets prickly and bristly or naked pubescent, rarely glabrous, leaflets deeply doubly-glandular-serrate, hairy and glandular beneath, flowers few yellow, calyx-tube hemispheric or globose. R. lutea, *Mill.*; *Boiss. Flor. Orient.* ii. 671; *Bot. Mag.* t. 363; *Brandis For. Flor.* 201. R. bicolor, *Jacq. Hort. Vind.* i. t. 1. (The Austrian rose.)

Drier parts of the inner Himalaya, from KISHTWAR westward and in WESTERN TIBET, alt. 8–11,000 ft.—DISTRIB. Affghanistan and westward to Asia Minor, and northward to Siberia.

A small bush, very leafy; prickles slender, much compressed, pale. *Leaves* 1½–3 in., leaflets 2–4 pair, ⅓–¾ in.; petiolulate, elliptic-obovate or orbicular, obtuse or apiculate, rather membranous, glabrous or sparsely hairy above; petiole pubescent and glandular; stipules broad, free portion half ovate, toothed. *Flowers* 2–2½ in. diam.; pedicel often glabrous; bracts ovate-lanceolate, long-acuminate, glandular. *Calyx-tube* glabrous, unarmed or prickly; lobes long-acuminate, tomentose, persistent, entire or with marginal laciniæ; tips usually dilated. *Petals* obcordate, variable in depth of colour.

5. **R. Webbiana.** *Wall. Cat.* 683; erect, prickles pale, bristles 0, leaflets oblong or orbicular, flowers subsolitary, calyx-tube usually glandular-bristly, sepals exceeding the petals, fruit ovoid or globose. *Royle Ill.* 208, t. 42; *Crepin in Bull. Soc. Bot. Belg.* xiii. 274; *Brandis For. Flor.* 202. R. unguicularis, *Bertol. Misc.* xxii. 15, t. 3. R. pimpinellifolia, *Herb. Ind. Or. Hook. f. & T.*

Drier inner Himalaya, from KASHMIR to KUMAON and WESTERN TIBET, alt. 5–13,500 ft.

Glabrous, or with pubescent petioles and leaves beneath; glandular hairs 0 or confined to the inflorescence; prickles copious, ¼–¾ in., straight or curved, with long bases, yellow. *Leaves* ½–2 in.; leaflets 2–5 pair, ¼–¾ in., rarely obovate, entire towards the usually rounded base, rarely pubescent; stipules small. *Flowers* pink, 1–3 in. diam., usually solitary. *Calyx* globose or ovoid, often densely bristly, rarely quite smooth; lobes caudate-acuminate, glandular, often with dilated tips, entire, persis-

tent. *Petals* obcordate. *Fruit* ovoid or globose, ½–1 in. diam., glandular or glabrous stigmas villous; achenes many, ⅛ in. long, pale.—Differs from *R. pimpinellifolia* in the fewer leaflets, uniform prickles, pubescent longer sepals, and fruit not depressed.

6. **R. sericea,** *Lindl. Monogr. Ros.* 105, t. 12; suberect, prickles broad compressed, bristly or not, leaflets acutely toothed towards the rounded tip silky beneath, flowers solitary ebracteate white or pale straw-coloured, petals usually 4, fruit pyriform. *Royle Ill.* 208; *Don Prodr.* 236; *Bot. Mag.* t. 5200; *Brandis For. Flor.* 202; *Crepin in Bull. Bot. Soc. Belg.* xiv. 151; *Wall. Cat.* 695. R. tetrapetala, *Royle Ill.* 208, t. 42. R. Wallichii, *Trattin. Ros.* ii. 293.

Temperate Himalaya, from KUMAON 9–13,000 ft. to SIKKIM, alt. 9–14,000 ft. and BHOTAN, alt. 5–10,000 ft.—DISTRIB. China, Yunan (form with leaves very hairy on both surfaces).

Erect or subscandent; branches perfectly glabrous and unarmed or prickly only, or also loosely or densely bristly and glandular; prickles ½–1¾ in., straight, brown. *Leaves* 1–3 in., crowded; leaflets 7–9, ¼–1 in., usually oblong, obtuse with an excurrent midrib, rarely villous on both surfaces; stipules oblong, membranous, apiculate. *Flowers* 2–2½ in. diam., on short lateral shoots, hence almost axillary; peduncle and calyx-tube bristly and glandular. *Calyx-lobes* pubescent, ovate-lanceolate, persistent. *Petals* obcordate, rarely 5, white rarely pink or faintly yellowish. *Fruit* subglobose or broadly pyriform, silky or glabrous; achenes few, ⅙ in. long.

SECT. II. *Styles* united into a column which is exserted far beyond the calyx-tube.

7. **R. moschata,** *Mill.*; *Brandis For. Flor.* 201; climbing, prickles recurved, leaflets ovate or ovate-lanceolate puberulous beneath, flowers many in compound corymbs white, sepals often pinnatifid, fruit small subglobose. *Wall. Cat.* 688; *Bot. Reg.* t. 829, 861. ? R. recurva, *Roxb. Fl. Ind.* ii. 514. R. Brunonii, *Lindl. Monogr. Ros.* 120, t. 14; *Don Prodr.* 236; *Bot. Mag.* t. 4030; *Wall. Cat.* 689 (*Brunonis*). R. Lindleyi, *Herb. Wall.* R. pubescens, *Roxb. Fl. Ind.* ii. 514. R. glandulifera, *Herb. Roxb.*

Temperate Central and Western Himalaya, from MURREE to NIPAL, alt, 2–11,000 ft. —DISTRIB. Affghanistan.

A tall climber; prickles scattered, stout. *Leaves* 2–6 in.; leaflets 2–4 pair, 1–3 in., acute or acuminate, serratures very numerous and acute, base rounded; stipules glandular, free part subulate. *Inflorescence* pubescent and usually glandular, but not prickly or bristly, bracts subulate. *Flowers* 1½–2 in. diam., very numerous; pedicels 1–1½ in., slender. *Calyx-tube* small, obovoid; lobes ½ in., lanceolate, caudate-acuminate, entire or cut or pinnatifid, reflexed after flowering, deciduous. *Petals* orbicular-obovate, yellowish-white. *Fruit* ⅓ in. diam., dark brown, glabrous; styles far exserted.

8. **R. longicuspis,** *Bertol. Misc. Bot.* xxi. 15, t. 3; climbing, prickles scattered curved, leaves evergreen, leaflets glabrous shining ovate-lanceolate serrate caudate-acuminate, petioles and inflorescence glandular and bristly, flowers corymbose, petals tomentose externally, fruit subglobose. *Crepin in Bull. Soc. Bot. Belg.* xiii. 256. R. sempervirens, *L.*; *Hook. f. & Thoms. Herb. Ind. Or.*

KHASIA MTS., alt. 2–5000 ft. MISHMI HILLS, *Griffith.*

A tall and often very strong climber, with a stout trunk. *Leaves* 3–6 in.; leaflets 2–3 pair, 2–3 in., petiolulate, firmly coriaceous, very sharply serrate, quite glabrous, base rounded; petiole stout, often glandular and prickly; stipules with ovate or subulate free portions. *Corymbs* short, more or less glandular, sometimes with minute prickles; bracts large, lanceolate, caudate, glandular all over. *Flowers* 1½ in. diam.; pedicels rather stout. *Calyx-tube* broadly obovoid; lobes very large with often ciliated toothed tips, sometimes with a few long teeth at the side. *Petals* obcor-

date, silkily tomentose externally. *Fruit* $\frac{1}{3}$–$\frac{1}{2}$ in. diam.; styles far exserted; achenes $\frac{1}{8}$ in.—Crepin sums up the distinction between this and its very near ally *R. sempervirens*, L., in the more coriaceous leaves with longer tips, the narrower stipules and bracts, the more or less pubescent pedicels and calyx, the narrower sepals, longer buds, and velvety back of the petals. Of these all but the last character are excessively variable, and I expect that the latter even may disappear.—There is a single specimen of this in Herb. Wallich from the Khasia (Pundua) under No. 696.

9. **R. Leschenaultiana,** *Wight & Arn. Prodr.* 301; climbing, prickles scattered curved, leaves evergreen usually glandular beneath, leaflets elliptic-ovate acute or acuminate serrate, petioles and inflorescence glandular-bristly, flowers corymbose, petals at length glabrous, fruit subglobose. *Wight Ic.* t. 38; *Crepin in Bull. Soc. Bot. Belg.* xxiii. 259. R. sempervirens *var.* Leschenaultiana, *Thory et Redouté Ros.* iii. 87. R. sempervirens, *Hook. f. & Thoms. Herb. Ind. Or.* R. Wallichii, *Sabine in Wall. Cat.* 687.

Western Peninsula; NILGHIRI and PULNEY MTS.

Very closely allied indeed to *R. brevicuspis*, and I believe only a variety of that plant, itself too near *sempervirens*; it differs in being more glandular, leaflets less acuminate, larger sepals and petals, the latter of which are pubescent only before expansion.

DOUBTFUL SPECIES.

R. MOORCROFTII, *Wall. Cat.* 693 from Ladak in Western Tibet. The specimen is wanting in Herb. Linn. Soc., but is probably *R. Eglantera*.

R. JACQUEMONTII, *Crep. MSS.*—I have only a fruiting specimen of this, which is quite insufficient for description. It is Jacquemont's No. 1170, p.

17. NEURADA, *Linn.*

An annual white woolly depressed branched herb. *Leaves* ovate, petioled, lobed; stipules minute. *Flowers* axillary, solitary. *Calyx-tube* flat, dilated, at length conic spiny and forming with the ripe carpels an orbicular disk; lobes 5, triangular; bracteoles 5, subulate. *Petals* 5, small. *Stamens* 10, inserted in the contracted mouth of the calyx, filaments subulate. *Carpels* 10 in a whorl, spreading; styles subulate, persistent; ovules solitary from the apex of the carpel. *Fruit* a depressed cone, with spinous margins; carpels 10, horizontal, dehiscing above, styles spinescent. *Seeds* curved, germinating within the carpels.—DISTRIB. N. Africa, Arabia, Persia, Affghanistan.

1. **N. procumbens,** *Linn.*; *Boiss. Fl. Orient.* ii. 735; *Wight Ic.* t. 1596; *Hook. Ic. Pl.* t. 840.

SCINDE, *Stocks.* SOUTHERN PUNJAB, Mooltan and Adunwhari hills.

Branches 5–10 in. *Leaves* $\frac{1}{2}$–$\frac{3}{4}$ in., ovate, tomentose on both surfaces. *Flowers* $\frac{1}{4}$ in. diam., shortly pedicelled. *Fruit* $\frac{1}{4}$–$\frac{3}{4}$ in. diam., under surface quite flat. The orbicular fruit forms a persistent collar at the top of the root of the young plant.

17.* CYDONIA, *Tourn.*

Bushes with black bark. *Leaves* simple, quite entire; stipules ovate, oblique. *Flowers* large, solitary, white or pink, woolly; bracts herbaceous, toothed. *Calyx-tube* clavate; lobes large, spreading, toothed. *Petals* 5, contorted in bud, claw woolly or glabrous. *Stamens* 20. *Ovary* 5-celled; styles 5, connate and

woolly below the middle; ovules many in each cell, 2-seriate, ascending or horizontal. *Fruit* subglobose, intruded at the base and apex, firm and fleshy, fragrant, 5-celled, cells many-seeded. *Seeds* small, plano-convex, testa mucilaginous.—DISTRIB. S. of Europe and the East, China.

1. **C. vulgaris,** *Pers.*; *Boiss. Fl. Orient.* ii. 656; *Dcne. Mem. Fam. Pom.* 128; *Wall. Cat.* 665. C. Sumboshia, *Ham. in Don Prodr.* 237. Pyrus Cydonia, *Linn.*; *Roxb. Fl. Ind.* ii. 511; *Brand. For. Fl.* 205.—The Quince.

Cultivated in N. W. India, and up to 5500 ft. in the Himalaya.—DISTRIB. Native country unknown; is self-sown in the East and in South Europe, &c.—Decaisne refers the Quince of N. W. India to *C. lusitanica*, Mill, but it certainly in no way differs from the common fruit of Europe.

18. DOCYNIA, *Dcne.*

Small trees. *Leaves* deciduous, simple, lobed in young plants; stipules small, subulate. *Flowers* white, solitary or fascicled. *Calyx-tube* clavate; limb shortly tubular, 5-partite; lobes reflexed, toothed. *Petals* 5, with long woolly claws, imbricate in bud. *Stamens* 30–50. *Ovary* 5-celled; styles 5-celled, connate and woolly below the middle; ovules 3, subbasilar in each cell. *Fruit* rounded ovoid or pyriform, flesh hard; cells 1–3-seeded; endocarp like parchment. *Seeds* plano-convex, testa coriaceous; cotyledons amygdaloid.—DISTRIB. Himalaya and the Khasia Mts.

1. **D. indica,** *Dcne. Mem. Fam. Pom.* 131, t. 14; leaves ovate or oblong-lanceolate long-acuminate entire or serrulate glabrous above beneath densely woolly at length glabrate, fruit almost globose. D. Griffithiana, *Dcne. l. c.* Pyrus indica, *Wall. Pl. As. Rar.* ii. 56, t. 173; *Roxb. Cat. Hort. Beng.* 38; *Fl. Ind.* ii. 511; *Kurz, For. Fl. Brit. Burm.* i. 441. Cydonia indica, *Spach, Suite Buff.* ii. 158; *Wenzig in Linnæa,* 1874, 12.

Eastern temperate Himalaya; SIKKIM, alt. 4–6000 ft. *J. D. H.* BHOTAN, alt. 7500 ft. KHASIA MTS., alt. 6000 ft. BIRMA, *Kurz.*—DISTRIB. Poneshee (Yunan).

A small tree, 12–15 ft., in a young state like a *Cratægus,* having 3-lobate lobulate and sharply toothed leaves and often spinescent branches; young parts of old plants densely clothed with white woolly tomentum. *Leaves* 3–4 in., coriaceous, at length quite glabrous, with prominent arched nerves beneath, serratures chiefly beyond the middle; petiole slender, $\frac{1}{4}$–1 in. *Flowers* 1–1$\frac{1}{2}$ in. diam., shortly pedicelled, densely woolly. *Calyx-tube* pyriform; lobes narrowly lanceolate. *Petals* spreading. *Filaments* long, slender. *Styles* slender, united at the base into a woolly cone. *Fruit* a nearly spherical yellow green apple, with orange spots, 1–1$\frac{1}{2}$ in. diam., and rather longer, rounded at the base and crowned with the broken sepals, usually 5-celled; cells 3-seeded; seeds quite like those of apple—it is rather austere with a slight quince flavour and forms a good stew.—*D. Griffithiana* from Bhotan is only *D. indica*.

2. **D. Hookeriana,** *Dcne. Mem. Fam. Pom.* 131, t. 15; leaves oblong or linear-lanceolate long-acuminate serrate, fruit between fusiform and ellipsoid contracted below the sepals.

KHASIA MTS., alt. 5000 ft., at Myrong, *J. D. H. & T. T.*

Very closely allied to *D. indica*, but the leaves are larger (4–5 in.) and narrower in proportion, and the fruit is of a wholly different shape and not half as long as broad. I have only fruiting specimens; these show no trace of woolliness, but no doubt in a younger state the branches and leaves are as woolly as those of *D. indica.*

19. **ERIOBOTRYA,** *Lindl.*

Small or large trees. *Leaves* simple, entire or serrate, very coriaceous; stipules lanceolate or broad. *Flowers* in thyrsoid panicles, white. *Calyx-tube* turbinate obconic or clavate; lobes small, erect or spreading, persistent. *Petals* 5, contorted or imbricate in bud, obovate or orbicular, usually oblique and notched, margins sinuate, claw glabrous or woolly. *Ovary* 2–5-celled; styles 5, connate and woolly below; ovules 2 in each cell, basal, ascending, placenta sometimes cupuliform. *Fruit* a succulent or dry rarely 1–2-celled berry; endocarp membranous, 1- rarely 2–3-seeded. *Seeds* large, ovoid and cylindric or flattened on one side, testa hard coriaceous and mucilaginous; cotyledons very thick.—DISTRIB. Himalaya, Malay Peninsula, China, Japan.

I cannot distinguish *Eriobotrya* from *Photinia*, except by the inflorescence; all the other characters given by Decaisne break down amongst the species enumerated under it; thus the petals are contorted in all but *elliptica* and *japonica*, and their claws are glabrous in several; the styles are only two in all but the above, and one other, which has 3 styles; the crown of the ovary is glabrous in *E. dubia*, and I do not find the calyptriform process of the placenta in any but *japonica*; but I have not examined all for this character, and it is one difficult to detect in dry specimens.

* *Petals contorted in bud. Styles* 2 *or* 3.

1. **E. petiolata,** *Hook. f.*; robust, leaves 6–9 in. long-petioled elliptic-lanceolate acuminate thickly coriaceous entire or obtusely serrate glabrous beneath, nerves 12–14 pair, inflorescence clothed with appressed tomentum, flowers pedicelled, calyx-lobes rounded, styles 2. E. elliptica, *Herb. Ind. Or. H. f. & T.*; *Dcne. Mem. Fam. Pom.* 145 *in part.*

Eastern Himalaya; SIKKIM, alt. 5–9000 ft. BHOTAN at Tongsa, *Griffith.*

A tree; branchlets glabrous. *Leaves* firmly coriaceous, 6–9 by 3–3½ in.; base acute; petiole 1½–2 in. *Panicles* 3–6 in. long and broad, branched from the base, very spreading, clothed with rusty tomentum as are the very young leaves on both surfaces. *Flowers* ½ in. diam., not crowded, shortly pedicelled. *Calyx-tube* short, obconic; lobes also short, semicircular. *Petals* contorted, orbicular, concave, claw glabrous. — Misled by the provisional naming of the Indian collections distributed by Dr. Thomson and myself, Decaisne has included this under *E. elliptica*, from which it differs entirely in the longer petioles, appressed almost scurfy tomentum of the panicle and form of calyx.

2. **E. latifolia,** *Hook. f.*; stout, leaves 6–8 in. long-petioled broadly elliptic acute at both ends quite entire glabrous above beneath with deciduous tomentum, nerves 10–12 pair, panicle softly tomentose.

MOALMAYNE; on Thoung Gyne, alt. 5000 ft., *Thos. Lobb.*

A shrub, 12 ft. *Leaves* firmly coriaceous, 3–4 in. broad, opaque above, quite glabrous beneath when old, without a trace of serratures, narrowed into the stout petiole which is 1½–2 in. long, and glabrous except the young leaves which are softly woolly. *Panicle* 6 in. long and as broad, much branched, clothed with rusty pubescence. *Flowers* ½ in. diam., crowded. *Calyx-tube* broadly obconic; *lobes* rounded. *Petals* contorted, broadly obovate or orbicular, claw glabrous. *Styles* 2.

3. **E. longifolia,** *Hook. f.*; robust, leaves 7–10 in. shortly petioled narrowly oblanceolate acuminate quite entire narrowed into the petiole, nerves 25–30 pair almost horizontal, panicle glabrate. Photinia longifolia, *Dcne. Mem. Fam. Pom.* 142.

MISHMI HILLS, *Griffith*.

A shrub, branchlets as thick as a swan's quill. *Leaves* firmly coriaceous, $1\frac{1}{4}$–$1\frac{3}{4}$ in. diam.; margins revolute (in drying?), perfectly glabrous, hardly shining above; petiole $\frac{1}{2}$ in. *Panicles* 4–5 in. long, glabrate; branches rather slender. *Flowers* shortly pedicelled, white. *Calyx* appressed-pubescent, tube obconic; limb $\frac{1}{6}$ in. diam.; lobes triangular, obtuse, glabrous within. *Petals* cochleate, claw glabrous. *Styles* 2, the united part pubescent.—I have not seen the petals, which Decaisne describes; he refers it to *Photinia*, but the habit foliage and inflorescence are altogether those of *Eriobotrya*.

4. **E. Hookeriana,** *Dcne. Mem. Fam. Pom.* 146; robust, leaves 8–12 in. very shortly and stoutly petioled elliptic- or oblong-lanceolate acuminate sharply coarsely serrate, more or less pubescent beneath, nerves 20–30 pair, panicle tomentose, branches spreading. Photinia subsessilis, *King in Herb. Calc.*

Eastern Himalaya; SIKKIM, alt. 6500–8000 ft., *J. D. H.* BHOTAN. alt. 4–6500 ft. *Griffith.*

A small tree, with very stout branches. *Leaves* 8–12 by 2–$4\frac{1}{2}$ in., when young thickly covered with rusty tomentose, old glabrate or glabrous, very thickly coriaceous, opaque above with impressed close-set nerves, serrated nearly to the truncate rounded or subacute base; petiole $\frac{1}{6}$–$\frac{1}{4}$ in., very thick; stipules semi-lunate, very coriaceous. *Panicle* 4–6 in. and as broad, finely softly tomentose, almost woolly. *Flowers* $\frac{1}{4}$ in. diam., white; bracts small, ovate; pedicels short, stout. *Calyx-tube* shortly obconic; lobes rounded, obtuse. *Petals* contorted, orbicular, claw woolly. *Styles* 2, base woolly. *Fruit* $\frac{3}{4}$ in. long, ellipsoid, yellow.

5. **E. dubia,** *Dcne. Mem. Fam. Pom.* 145, *excl. some syn.*; rather slender, leaves 3–5 in. shortly petioled elliptic-lanceolate or oblanceolate acuminate quite glabrous shining above coarsely sharply serrate, nerves 10–12 pair, panicle softly tomentose or only puberulous, crown of ovary glabrous. Photinia? dubia, *Lindl. in Trans. Linn. Soc.* xiii. 104, t. 10; *Wall. Cat.* 668, 1. P. dubia, *Wenzig in Linnæa*, 1874, 94, *excl. synonym.* Cratægus? Shicola, *Ham. in Don Prodr.* 238. Mespilus tinctoria, *Don Prodr.* 238.

Central and Eastern Himalaya; NEPAL, *Wallich*; SIKKIM, alt. 5–6000 ft., *J. D. H.* BHOTAN alt. 4000 ft., *Griffith.*

A small tree, 20–40 ft. *Leaves* thinly coriaceous, not exceeding $1\frac{1}{2}$ in. broad, gradually narrowed at the base into the petiole, which is slender and $\frac{1}{4}$–$\frac{1}{2}$ in. *Panicles* 2–4 in. long and broad; branches rather slender. *Flowers* not crowded, $\frac{1}{4}$ in. diam., white, shortly pedicelled; bracts short, subulate. *Calyx-tube* short, obconic; lobes rather variable, short, acute or obtuse. *Petals* orbicular, claw slightly woolly. *Styles* 2, glabrous, on the short hemispheric glabrous top of the ovary. *Fruit* $\frac{1}{2}$ in long, shortly ellipsoid, 1-seeded, eatable.

6. **E. bengalensis,** *Hook. f.*; rather stout, leaves 4–8 in. long-petioled elliptic or elliptic oblong or lanceolate acuminate coarsely obtusely serrate or lobulate quite glabrous shining above, nerves 8–12 pair, panicle softly tomentose, crown of ovary woolly. E. dubia, *Dcne. Mem. Pom.* 145, *in part*; *Kurz, For. Fl. Brit. Burm.* 443. Mespilus bengalensis, *Roxb. Cat. Hort. Beng.* 38; *Fl. Ind.* ii. 510. Photinia dubia, *Wall. Cat.* 668, 2, 3, 4, and *E.*

Eastern Himalaya; SIKKIM, alt. 4000 ft., *C. B. Clarke.* KHASIA MTS. and Muku hills, alt. 3–4000 ft. CHITTAGONG, AVA. *Wallich*; TENASSERIM, *Helfer*; MALACCA, *Griffith, Maingay.*—DISTRIB. Bhamo.

A large robust tree. *Leaves* often $2\frac{1}{2}$ and sometimes $3\frac{1}{2}$ in. broad, sometimes acute, obtuse or rounded with coarse lobules or crenatures; petiole stout or slender, $\frac{3}{4}$–$1\frac{3}{4}$ in., glabrous. *Panicles* 3–5 in. long and broad, branched from the base, branches rather stout. *Flowers* $\frac{1}{3}$ in. diam., white, smelling of hawthorn. *Calyx-tube* obconic; lobes acute or obtuse. *Petals* orbicular, claw slightly woolly. *Styles* 2, base very woolly. *Fruit* $\frac{3}{4}$ in. long, ellipsoid, 1–2-seeded, uneatable.—Confounded by Wallich, myself,

and others with *E. dubia*, but very distinct; a much larger tree, with longer broader petioled leaves with slender petioles; the top of the ovary being woolly also well distinguishes it.

7. **E. angustissima,** *Hook. fil.*; quite glabrous, leaves erect 2–4 in. very narrow linear-lanceolate narrowed into the short petiole obtuse remotely serrate, panicle small glabrous.

KHASIA MTS. alt. 5000 ft. *Simons*; Mooshye, and between Myrung and Nunklow, *Hook. f. & T.*

A very remarkable shrub, 4 ft. high, found by Thomson and myself in but two spots, and there forming a low fastigiate brushwood on river banks, with stout dark branches, and erect rigid leaves, not much exceeding ½ in. in breadth; nerves 8–10 pair, ascending; petiole slender, ¼ in. *Panicles* 1½ in.; branches short, erect, glabrous. *Flowers* few, ⅓ in. diam. *Calyx* pubescent; tube short; lobes rounded. *Petals* obovate or obcordate, claw woolly. *Styles* 3, slender, base and crown of ovary woolly.

** *Petals quincuncial. Styles* 5.

8. **E. elliptica,** *Lindl. in Trans. Linn. Soc.* xiii. 102; very robust, leaves petioled 6–10 in. obovate or oblong-lanceolate entire or coarsely serrate glabrous beneath, nerves about 20 pair, inflorescence densely clothed with soft spreading wool, flowers sessile, styles 5, fruit small obovoid or globose. *Wall. Cat.* 667. E. japonica, β. elliptica, *Wenzig in Linnæa*, 1874, 100. Mespilus Cuila, *Ham. in Don Prodr.* 238.

NEPAL, *Wallich*; MISHMI HILLS, *Griffith*.

Similar in many respects to *E. japonica*, but leaves much broader, glabrous beneath, with glabrous petioles 1–1½ in. *Flowers* sessile or subsessile. *Calyx-lobes* triangular. *Petals* orbicular, claw woolly. *Styles* 5, woolly to the top; stigmas large, spathulate, recurved. Griffith's specimens have fruit, which is nearly globose upwards of ½ in. diam. and 1-seeded.

9. **E. japonica,** *Lindl.*; branches very robust, and leaves beneath and inflorescence densely softly woolly, leaves subsessile narrowly oblanceolate acuminate remotely serrate woolly beneath, petiole very short, fruit ovoid large intruded at the top. *W. & Arn. Prodr.* 302; *Dalz. & Gibs. Bomb. Flor. Suppl.* 32; *Wight Ic.* t. 226. Mespilus japonica, *Banks*; *Roxb. Fl. Ind.* ii. 510. (The Loquat.)

Cultivated in many parts of India.

Branchlets as thick as the little finger. *Leaves* 6–8 by 1½–3 in., thick and stiffly coriaceous; base obtuse or narrowed into the very short stout woolly petiole; nerves 12–15, very prominent beneath. *Panicles* 3–6 in. long and broad; branches very stout. *Flowers* ½ in. diam., crowded, fragrant. *Calyx-tube* short; lobes ovate, subacute. *Petals* broadly ovate. *Fruit* 1–1½ in. long, rather narrower, yellow, rarely as many as 5-seeded.

IMPERFECTLY KNOWN SPECIES.

E. MACROCARPA, *Kurz, For. Fl. Brit. Burm.* ii. 443; evergreen, glabrous, leaves 5–6 in., from obovate to oblong-lanceolate shortly subobtusely acuminate quite entire narrowed into the stout ½–¾ in. petiole coriaceous smooth glossy, fruit subglobose size of a bullet glabrous crowned with the calyx-limb, peduncle 1–3 in. stout simple glabrous axillary in the upper leaves of the thick branchlets.—BIRMA, rare in forests on N. E. slopes of Kambala-toung; and Pegu at Yomah, alt. 2–3000 ft., *Kurz*.

20. PYRUS, *Linn.*

Trees or shrubs. *Leaves* deciduous, simple or pinnate; stipules deciduous. *Flowers* white red or pink, in terminal cymes or corymbs; bracts subulate or

linear. *Calyx-tube* urceolate turbinate or obconic, lobes 5 erect or reflexed, persistent or deciduous. *Petals* 5, quincuncially imbricate in bud. *Stamens* 20 or more, filaments sometimes connate at the base. *Disk* annular, or coating the calyx-tube. *Carpels* 2–5, connate and adnate to the calyx-tube, styles 2–5, free or connate below, stigmas truncate; ovules 2 in each cell, basal, collateral, ascending. *Fruit* (a pome) fleshy, 2–5-celled; cells with a membranous or cartilaginous often 2-valved endocarp, 1–2-seeded. *Seeds* when in pairs plano-convex, testa coriaceous; cotyledons amygdaloid.—DISTRIB. N. temp. and cold regions; species 40.

SECT. I. **Malus.** *Leaves* entire. *Ovary* 3–5-celled; styles more or less united below. *Fruit* globose; flesh of uniform consistence; endocarp coriaceous or like parchment.—Flowers fascicled or subumbellate.

1. **P. Malus,** *Linn.*; *Ledeb. Fl. Ross.* ii. 96; leaves ovate shortly acuminate crenate glabrous above tomentose beneath, calyx densely tomentose lobes persistent, petals pink, fruit large very shortly peduncled. *Roxb. Fl. Ind.* ii. 511; *Brandis For. Fl.* 205; *Wall. Cat.* 7111. Malus communis, *Desf.*; *Boiss. Fl. Orient.* ii. 656; *Dcne. Mem. Fam. Pom.* 153.

Apparently wild in the NORTH WESTERN HIMALAYA, ascending to 9000 ft., and to 11,400 in WESTERN TIBET; cultivated in N. W. India, Central India, the Dekkan, &c.—DISTRIB. from Persia westwards to the Mediterranean.

A tree, rarely exceeding 30 ft. *Branches* and foliage at length glabrous. *Leaves* 2–3 in.; petiole half the length of the blade, tomentose or woolly. *Flowers* 1½–2 in. diam. *Calyx-lobes* broad-ovate, acute, persistent. *Petals* with a tomentose claw. *Styles* 5, united below the middle. *Fruit* globose, intruded at both ends.

2. **P. baccata,** *Linn.*; *Ledeb. Fl. Ross.* ii. 97; leaves elliptic-ovate acuminate serrulate glabrous, calyx glabrous, peduncles very long, petals white, fruit small globose. P. baccata v. himalaica, *Maxim. Diag. Dec.* xv. 167; *Wenzig in Linnæa,* 1874, 44; *Brandis For. Fl.* 205; *Wall. Cat.* 681. Malus baccata, *Desf.*; *Dcne. Mem. Fam. Pom.* 154. (The Siberian Crab.)

Temperate Himalaya; from KASHMIR to KUMAON, alt. 6–10,000 ft. (sometimes cultivated), and in BHOTAN, alt. 7500 ft., *Griffith.* KHASIA MTS., alt. 6000 ft.—DISTRIB. Siberia to Manchuria.

A small tree, trunk short, head rounded. *Leaves* 2–3 in., rarely almost orbicular, young glabrous or as well as the petiole pubescent; petiole half the length of the blade. *Flowers* 1½–2 in. diam., in sessile umbels or fascicles, rarely with the pedicels collected on a short peduncle; pedicels slender, 2–3 in. *Calyx* glabrous or puberulous, without tomentum within; lobes lanceolate, deciduous. *Petals* very variable in breadth. *Styles* 3–5, nearly free, very woolly at their united bases. *Fruit* ½–1 in. diam., red or scarlet, intruded at the base.—The fruit of this is much smaller than in the common form of the plant, and often subpyriform like that figured in Pallas Flora Rossica, i. t. x.

3. **P. sikkimensis,** *Hook. f.*; leaves ovate or ovate-lanceolate acuminate serrulate tomentose beneath, calyx woolly, peduncles very long, fruit small shortly pyriform.

SIKKIM HIMALAYA, alt. 7–10,000 ft., *J. D. H.* BHOTAN, *Griffith.*

Very similar to *P. baccata*, but the leaves (which attain 5 by 3 in.) are more acutely serrate, woolly beneath and on the petiole and on the midrib above, the peduncles and calyx are also very woolly. It is marked by Decaisne as a distinct species (of *Malus*), but I suspect it will prove a form of *P. baccata*. The claw of the petals is woolly; the limb broadly obovate-oblong or almost orbicular; the styles are united below the middle into a perfectly glabrous column; the calyx-lobes deciduous; the

stamens about 25; the fruit speckled and very good stewed.—The specks on the fruit are like those of *P. variolosa*, but smaller,

SECT. II. **Pyrus proper.** *Leaves* entire. *Petals* white, claw glabrous. *Ovary* 5-celled; styles free. *Fruit* globose or pyriform, flesh granular.—Flowers in few-flowered corymbs.

4. **P. communis,** *Linn.*; *Boiss. Fl. Orient.* ii. 653; leaves oblong ovate acute crenulate or subentire hardly exceeding the slender petiole, corymbs short, calyx-lobes ovate or lanceolate persistent, fruit pyriform. *Roxb. Fl. Ind.* ii. 510; *Brandis For. Fl.* 203. (The Common Pear.)

Believed to be wild in KASHMIR (*Brandis*); cultivated in the N. W. HIMALAYA, alt. 2–8000 ft., and in WESTERN TIBET to alt. 10,000 ft.—DISTRIB. N. Persia westward to S. Europe,

A tree or shrub, glabrous or with woolly young parts and inflorescence, young often spinous. *Leaves* variable in breadth and in length of point, of young plant lobed. *Corymbs* terminating short shoots. *Flowers* 1½ in. diam. *Calyx*-lobes variable. *Petals* obovate, white. *Fruit* 1–2 inches, gradually narrowed into the peduncle.

5. **P. Pashia,** *Ham. in Don Prodr.* 236; young parts woolly, leaves ovate or ovate-lanceolate acuminate crenulate the young serrulate, glabrous when old, cymes corymbose or subumbellate woolly, calyx-lobes acute deciduous, petals white and pink, fruit globose warted. *Wenzig. in Linnæa*, 1874, *Decaisne Jard. Fruit., Le Poirier*, t. 7 (*Pirus*); *Kurz, For. Fl. Brit. Burm.* 441. P. variolosa, *Wall. Cat.* 680; *Brandis For. Fl.* 204. P. verruculosa, *Bertol. Piant. Nuov. Asiat.* ii. 10, t. 2. P. nepalensis, *Herb. Ham. et. Hort.*

Temperate Himalaya from KASHMIR to BHOTAN, alt. 2500–8000 ft. (sometimes cultivated, *Brandis*). KHASIA MTS., alt. 5000 ft. AVA, *Wallich*.—DISTRIB. Yunan.

A deciduous tree, in a young state like a *Cratægus* with 3 lobed and doubly sharply serrated leaves glabrous or woolly beneath, and often spinescent branches; branches dark, woody. *Leaves* 2–4 in., acuminate, sometimes caudate, glabrous and black when dry; petiole slender, half the length of the blade. *Inflorescence* very variable, usually corymbose with a very short peduncle and woolly, but the peduncle sometimes very thin, or is all but absent when the flowers are fascicled or umbelled; pedicels ½–2 in., slender in flower, stout in fruit. *Flowers* 1 in. diam. *Calyx-lobes* ovate, acute, usually very woolly, especially externally. *Petals* orbicular-obovate. *Stamens* about 30. *Styles* 3–5, quite free, more or less woolly at the base. *Fruit* very variable in size, ¾–1½ in. diam., dark yellow-brown, scurfy, covered with raised white spots, austere, eatable when decaying.—A very variable plant, especially in the inflorescence; I was inclined to suppose that Khasia specimens with acutely serrated leaves and longer pedicels were different specifically, but I suspect the leaves were from young trees, and there is every gradation of pedicel from ½–2 in.

6. **P. kumaoni,** *Dcne. Jard. Fruit. under Pirus Pashia*; leaves ovate or ovate-lanceolate acute or acuminate crenulate, glabrous, base acute or rounded, cymes corymbose glabrous, calyx-lobes broad rounded glabrous except the woolly margins, fruit globose warted.

Western Himalaya, from KASHMIR to KUMAON, alt. 5–8000 ft., *Royle, Strach. & Winterbottom*, &c.

Very similar in foliage to *P. Pashia* but at once distinguishable by the more glabrous corymbs and broad rounded calyx-lobes.

7. **P. Jacquemontiana,** *Dcne. Jard. Fruit.* (*Pirus*) t. 8; leaves ovate or oblong-lanceolate acute crenulate glabrous, base rounded, corymbs laxly tomentose, lobes tomentose above, young fruit glabrate.

PUNJAB in woods by mountain torrents, *Jacquemont.*

I know this only by the above characters given by its author, who says that it much resembles *P. Pashia*, but is easily recognised by its smooth young fruit; he however does not speak positively of its being a distinct species. The form of the calyx-lobes is not stated.

SECT. III. **Aria.** *Leaves* simple, entire or margin lobulate. *Calyx-lobes* persistent. *Ovary* 2–5-celled, styles 2–5. *Fruit* pyriform or globose crowned with the calyx-lobes, flesh granular, endocarp membranous.

8. **P. lanata,** *Don Prodr.* 237; leaves broadly oblong margins lobulate lobules serrulate woolly beneath, corymbs densely woolly, petals glabrous within, styles 2–3 woolly all over. P. kumaonensis, *Wall. Cat.* 678. P. Aria, *Herb. Ind. Or. Hook. f. & Thoms.*; *Brandis For. Fl.* 206 (*excl. syn. P. vestita*). P. Aria *var.* kumaonensis, *Maxim. Diagn. Dec.* xv. 173. Sorbus lanata, *Wenzig in Linnæa*, 1874, 61.

Eastern temperate Himalaya; from KASHMIR to KUMAON, alt. 8–10,000 ft.

A middle sized tree, with the young parts densely woolly; bark of branches smooth, dark brown, shining. *Leaves* 5–8 by 2–4 in., acute, glabrous above when old, except often the midrib; lobules of leaf with many serratures; base acute or rounded; nerves 8–12, nearly straight; petiole $\frac{1}{2}$–$\frac{3}{4}$ in. *Corymbs* short, 2–5 in. broad, terminal and subterminal, much branched. *Flowers* shortly pedicelled, $\frac{1}{2}$ in. diam., white. *Calyx* turbinate; lobes short, ovate, acute. *Petals* narrowly obovate, narrowed into naked claw. *Stamens* 20. *Styles* 2–3, densely woolly. *Fruit* very few in a corymb, or solitary, $\frac{1}{2}$–1$\frac{1}{2}$ in. diam., globose and 2–3-seeded, or smaller pyriform and 1–2-seeded.—This differs from *P. Aria* in the lobulate leaves (like those of *P. latifolia*, Poir.) with regularly serrulate lobes, much larger flowers and fewer very large fruits, the latter of which are very variable in size and shape according to the number of seeds ripened. I have not cited *Aria kumaonensis*, Dcne., or *A. lanata*, Dcne. (Mem. Fam. Pom. 162, 163) under this or the following, the species being so much confounded; one of them is the *Sorbus nepalensis* of gardens and *Cratægus* (*Aria*) *cuspidata*, Spach. (*Suite Buff.* ii. 106).

9. **P. vestita,** *Wall. Cat.* 679; leaves elliptic acute not or obscurely lobulate serrulate very shortly petioled most densely woolly beneath and on both surfaces when young, corymbs densely woolly, petals woolly within, styles 3–5 woolly at the base only. P. crenata, *Lindl. in Bot. Reg.* t. 1655, *not of Don*; *Wenzig in Linnæa*, 1874, 60.

Temperate Himalaya; from GARWHAL to SIKKIM, alt. 9–10,000 ft.

A tree very closely allied to *P. lanata*, but distinguished by the more elliptic and more woolly leaves with rarely marginal lobules, and more numerous nerves. The shorter broader petals woolly within and the styles glabrous except at the very base, are excellent characters. The figure in the 'Botanical Register' if intended for this, is a very bad one in respect of its representing slender petioles and a want of woolly clothing. I do not understand why Lindley identifies it with Don's *P. crenata*, the leaves being serrate and not crenate, and the corymbs compound. Very old leaves have the tomentum on the leaves beneath appressed, polished and silvery.

VAR. *khasiana*; leaves smaller, narrower, very membranous. P. Aria, L.? *Hook. f. & T. Herb. Ind. Or.*—Khasia, alt. 5–6000 ft.

SECT. IV. **Sorbus.** *Leaves* pinnate. *Calyx-lobes* persistent. *Ovary* 2–4-celled. *Styles* 2–5, free. *Fruit* globose crowned with the persistent calyx; endocarp membranous or coriaceous.

10. **P. Aucuparia,** *Gærtn.*; *Ledeb. Fl. Ross.* ii. 100; glabrous or with white woolly down, leaflets 7-12 pair linear-oblong obtuse and apiculate or

oblong lanceolate and acuminate sharply serrate green beneath, petals orbicular. P. ursina, *Herb. Strach. & Wint.* No. 5. Sorbus Aucuparia, *Linn.*; *Boiss. Fl. Orient.* ii. 657.

Western temperate Himalaya, from KASHMIR to KUMAON, alt. 11,500–13,000 ft. DISTRIB. Turkestan and from the Caucasus westward to the Atlantic, and from Siberia to N. China and Japan.

A small tree, young parts with white cottony tomentum which sometimes persists on the petioles and inflorescence. *Leaves* 4–8 in.; leaflets $\frac{3}{4}$–$1\frac{1}{2}$ in., entire towards the rounded base. *Corymbs* usually quite glabrous. *Flowers* $\frac{1}{3}$–$\frac{1}{2}$ in. diam., pedicels short. *Calyx* glabrous, lobes broad short rounded or subacute. *Petals* white, orbicular. *Styles* 2–5, quite free, woolly at the base. *Fruit* globose, $\frac{1}{3}$–$\frac{1}{2}$ in. diam., red.—Strachey and Winterbottom's specimens have a fine glaucous bloom on the fruit which appears to have been blue like those of *P. foliolosa,* but the specimens want the rusty tomentum of that species.

11. **P. foliolosa,** *Wall. Pl. As. Rar.* ii. 81, t. 189; *Cat.* 667, *in part*; pubescence on leaves beneath petioles and inflorescence rusty brown, leaflets 10–15 pair linear-oblong acute or obtuse apiculate sharply serrate pale brown when dry beneath, petals orbicular-obovate, style very short. P. ursina, *Wall. Cat.* 675; *Brandis For. Fl.* 206. Sorbus ursina *and* foliosa (*error for* foliolosa), *Dcne. Mem. Fam. Pom.* 159. S. ursina, *Wenzig in Linnæa,* 1874, 75.

Temperate Himalaya, from KUNAWUR to SIKKIM, alt. 9–12,000 ft.

Very near *P. Aucuparia,* but a more rubust plant with red-brown tomentum on the petioles inflorescence and midribs of the leaves beneath, at length glabrate; the flowers also are smaller, more densely crowded, with linear bracts intermixed, and have much stouter peduncles and pedicels. *Fruit* small, bluish-red, ovoid, globose or turbinate. *Styles* usually 5.—The flowers in Sikkim specimens are greenish white and rather fœtid, but Gen. Munro sends a specimen from Kunawur with red flowers. Wallich describes the fruit as red.—There are two specimens under this name and number in Wallich's Herbarium, one with the lithographed ticket 677 attached has also a MSS. label stating it to have been procured from Gossain Than (a locality in Nepal which Wallich did not himself visit); the other specimen has a similar MSS. ticket stating it to be found at Sheopore by himself; on both tickets he has written 'an ab. *ursina,* Wall. distincta?'—Of these the first in no way differs from his three sheets of *P. ursina* (Cat. 675); whilst the second is a totally different plant, viz. *P. Wallichii,* mihi. The description in Wallich's 'Plant. As. Rar.' is that of his *foliolosa* (and *ursina*) except in that he describes the tomentum of the young plant as white, whereas it is rusty-red, as he says it is on the fully developed leaves &c. As the *ursina* of Wallich's Catalogue and Herbarium is the *foliolosa* of his Plant. As. Rar., the latter name must replace the former.

12. **P. microphylla,** *Wall. Cat.* 676; nearly glabrous, slender, leaflets 10–17 pair small linear-oblong acute deeply and acutely serrate, corymbs long-peduncled lax-flowered, petals small orbicular. Sorbus microphylla, *Dcne. Mem. Fam. Pom.* 159; *Wenzig in Linnæa,* 1874, 76.

Temperate Himalaya; SIRMORE, *Webb* (*in Herb. Wall.*); SIKKIM, alt. 10–14,000 ft., *J. D. H., C. B. Clarke.*

Possibly only a form (or young state?) of *P. foliolosa* or *Aucuparia,* but a very much more slender subscandent plant with more deeply serrate leaflets, $\frac{1}{3}$–$\frac{2}{3}$ in. long, very slender flattened petioles, longer peduncles and pedicels and large bluish berries and 5 styles. Wallich's specimens have no flowers, those of Sikkim ones are red, and the globose fruit is white or pale blue. What pubescence is present resembles that of *P. foliolosa.* It is remarkable that no one since Capt. Webb has found this in the Western Himalaya.

13. **P. Wallichii,** *Hook. fil.*; young parts clothed with white wool, leaflets 5–9 pair 1–2 in. linear-oblong acute or apiculate obscurely serrate

towards the tip, glaucous beneath, corymbs very tomentose compound, petals broadly obovate. P. foliolosa, *Wall. Cat.* 677, *in part.* Sorbus foliosa, *Wenzig in Linnæa*, 1874, 75, *excl. synon.*

Central and Eastern temperate Himalaya; NEPAL, *Wallich.* SIKKIM, alt. 6500–9000 ft., *J. D. H.*, &c.

A small tree, young parts densely woolly, old glabrate except the corymb. *Leaves* 4–6 in; leaflets coriaceous, sometimes perfectly entire, base very unequal-sided, midrib stout; nerves numerous, slender. *Corymbs* 2–3 in. diam.; peduncle and pedicels stout. *Flowers* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., white. *Styles* 3, glabrous. *Fruit* (unripe) very small, ovoid, $\frac{1}{8}$ in. diam.—A very distinct species.

14. **P. insignis,** *Hook. f.*; very robust, leaflets 4–6 pair 3–4 in. linear-oblong acutely obscurely crenulate very coriaceous glaucous beneath, fruiting corymbs excessively compound, branches very stout.

SIKKIM HIMALAYA, alt. 8–11,000 ft., *J. D. H.*, *C. B. Clarke.*

A small very robust tree; branchlets nearly as thick as the little finger, bud-scales rigid, chestnut-brown, shining; young parts clothed with long rather silky rusty brown wool, old glabrous. *Leaves* 6–10 in.; leaflets soon glabrate, apiculate in the sinus between the obscure crenatures, which are incurved in old leaflets, pale and rather glaucous beneath; base unequal-sided; young petioles densely silky. *Flowering corymbs* appearing with the young leaves, densely rufously woolly, with stout peduncle and branches. *Flowers* crowded, $\frac{1}{4}$ in. diam.; bracts linear. *Calyx* obconic, short, teeth triangular. *Styles* 3, glabrous. *Fruiting corymbs* branched from the base, 6 in. long and as broad; branches covered with oblong white spots, pedicels short stout. *Fruit* globose or broadly ovoid, 3-celled, $\frac{1}{3}$ in. diam. (when dry).

SECT. V. **Micromeles** (Dcne. Gen.). *Leaves* simple. *Calyx*-lobes deciduous. *Ovary* 2–3-celled; styles 2–3, free or united. *Fruit* globose, umbonate; endocarp membranous or coriaceous.

* *Leaves shortly petioled, narrowed to both ends; nerves very oblique close set nearly straight, very prominent.*

15. **P. Griffithii,** *Dcne. Mem. Fam. Pom.* 170 (Micromeles); leaves 5–9 in. young woolly beneath elliptic acuminate serrulate, corymbs very many-flowered densely woolly, fruit small. P. sikkimensis γ. microcarpa, *Wenzig in Linnæa*, 1874, 59.

SIKKIM HIMALAYA, alt. 6–9000 ft., *J. D. H.*, *C. B. Clarke.* BHOTAN, *Griffith.*

A tree, with stout branches; young twigs and leaves covered beneath with a soft cottony wool that is deciduous in flakes. *Leaves* coriaceous, opaque above, paler beneath; nerves 12–15 pair, slightly curved; petiole $\frac{1}{4}$ in., stout, channelled. *Corymb* 5–6 in. diam., branched from the base, most densely woolly. *Flowers* $\frac{1}{3}$ in. diam., white. *Calyx-tube* obconic, woolly; lobes ovate, membranous, subacute. *Petals* obovate, glabrous. *Stamens* long. *Disk* tumid, 10-lobed, woolly. *Styles* 2, slender, glabrous. *Fruit* size of a pea, 1–2-celled, cells 2-seeded. *Seeds* plano-convex.—Very similar to *Pyrus vestita.*

16. **P. rhamnoides,** *Dcne. Mem. Fam. Pom.* 169 *in part* (Micromeles); leaves 3–5 in. very young hairy beneath elliptic acuminate serrulate, petiole short slender, corymbs tomentose many-flowered, fruit small not spotted 2-celled. Photinia polyneura, *King in Herb. Calc.*

SIKKIM HIMALAYA, alt. 7–9000 ft., *J. D. H.*, *C. B. Clarke.*

A tree, very young branches and leaves tomentose and hairy, soon glabrous. *Leaves* coriaceous, very variable in breadth, $\frac{2}{3}$–2 in.; nerves 12–14 pair, very prominent beneath, slightly curved; petiole $\frac{1}{2}$–$\frac{3}{4}$ in. *Corymbs* branched from the base,

pubescent in flowers, glabrous in fruit. *Flowers* $\frac{1}{3}$ in. diam., white; pedicels slender. *Calyx-tube* obconic, hairy; lobes triangular. *Petals* broadly oblong, glabrous. *Stamens* long. *Disk* tumid, 10-lobed, puberulous. *Styles* 2, slender, united below the middle or free, glabrous. *Fruit* $\frac{1}{4}$ in. diam., smooth, endocarp thin; cells 2-seeded. *Seeds* plano-convex.

** *Leaves more or less ovate (rarely obovate), petiole slender. Disk in the umbo of the fruit tumid or flat not lobed.*

17. **P. khasiana,** *Dcne. Mem. Fam. Pom.* 169 *in part* (Micromeles); leaves 4 in. elliptic-obovate rather suddenly acuminate serrate, nerves very oblique nearly straight, fruit $\frac{1}{2}$ in. diam. spotted 4-celled.

KHASIA MTS.; at Nungbree wood, alt. 5000 ft., *Griffith.*

A tolerably large tree, in foliage more like *P. rhamnoides* than any of the following species, having many nearly straight nerves. The only specimens (Griffith, 2078, 1044 of Posth. Papers, ii. 67) are in old leaf and fruit, which latter Griffith describes as of the size of a cherry; it is constantly 4-celled; the endocarp thick and coriaceous; the cells narrow 1-seeded, the pulp granular, and is 4-angled when dry and has a narrow depressed umbo with a conical centre.

18. **P. granulosa,** *Bertol. Piant. Nuov. Asiat.* ii. 10, t. 3; leaves ovate-lanceolate long-acuminate serrate, base rounded or acute, nerves 8–10 pair spreading arched, fruits few in a corymb $\frac{1}{2}$–$\frac{3}{4}$ in. diam. spotted 4-celled. P. sikkimensis, *Wenzig in Linnæa,* 1874, 58, *in part*; *Kurz, For. Fl. Brit. Burm.* i. 442. P. Karensium, *Kurz in Journ. Beng. As. Soc.,* 1872, ii. 306; 1873, ii. 232.

KHASIA MTS. *Griffith*; near Churra, Myrung and Mamloo, alt. 4–6000 ft., *J. D. H. & T. T.* MARTABAN, alt. 7000 ft., *Kurz.*

A shrub or small tree, in a fruiting state perfectly glabrous, branches with oblong white lenticels. *Leaves* 4–5 in., stiff; nerves prominent beneath; petiole 1–1$\frac{1}{4}$ in. *Fruiting corymb* with smooth branches. *Fruit* with the flesh of large granules, endocarp thickly coriaceous, cells narrow; umbo small depressed with a small conical centre.—Differs from *P. khasiana* in the ovate leaves with arching nerves.

19. **P. polycarpa,** *Hook. f.*; quite glabrous, leaves ovate-lanceolate long-acuminate serrate, base rounded or acute, nerves 6–8 pair spreading arched, corymbs effuse perfectly glabrous, fruit $\frac{1}{6}$ in. unspotted. Pyrus, *b. Herb. Ind. Or. H. f. & T.*

KHASIA MTS., alt 5–6000 ft., *Griffith, Simons,* &c.

A small tree, foliage remarkably similar to that of *P. granulosa,* but the nerves fewer, and at once distinguished by the very small unspotted fruit, with only 2 cells both broad, and small seeds with thick plano-convex cotyledons. The only flowering specimen I have is from M. Simons, in it the *corymb* is much branched, perfectly glabrous, and smooth, somewhat warted in fruit.—*Flowers* $\frac{1}{3}$ in. diam.; pedicel slender. *Calyx-tube* rather pyriform; limb expanded; lobes triangular-ovate. *Petals* nearly orbicular, glabrous, concave. *Disk* inconspicuous, glabrous. *Stamens* long, slender. *Styles* 2, united to the middle, quite glabrous. *Fruit* rather ovoid, $\frac{1}{6}$–$\frac{1}{4}$ in., umbo large for its size, depressed with a conical centre.

20. **P. cuspidata,** *Bertol. Piant. Nuov. Asiat.* ii. 9, t. 1; young parts flocculent, leaves ovate or elliptic-ovate long-petioled caudate-acuminate serrate, nerves 10–12 spreading arched, corymbs contracted densely warted when in fruit, fruit small not spotted 2- very rarely 3-celled. Micromeles verrucosa, *Dcne. Mem. Fam. Pom.* 169. Rosacearum? frutex, *Brown in Wall. Cat.* 7467.

KHASIA MTS., alt. 4–5000 ft., *Wallich,* &c.

A large tree, with pale foliage; branchlets stout, studded with oblong lenticels;

twigs and young parts clothed with a flocculent cotton that falls away in white flakes. *Leaves* 3–4 in., rather membranous, pale green, not shining, point very long, coarsely serrate, base acute or rounded; petiole very slender. *Corymb* more rounded than in its allies, white and tomentose when young, more rusty or glabrous when old; branches rather short; covered when fruiting with raised lenticels. *Flowers* $\frac{1}{4}$ in. diam.; pedicels slender. *Calyx-tube* pyriform; limb expanded, glabrous within, teeth triangular, acute. *Petals* obovate, woolly within in bud, claw pubescent. *Stamens* slender. *Disk* glabrous, inconspicuous. *Styles* 2, very slender, united below the middle, glabrous. *Fruit* $\frac{1}{3}$ in. diam., rather pyriform, crown tubular $\frac{1}{4}$ its own diameter, with a deep depression and conical centre.

21. **P. ferruginea,** *Hook. f.*; branchlets leaves beneath and corymbs densely clothed with rusty wool, leaves very shortly petioled broadly elliptic suddenly acuminate serrulate, corymbs few-flowered, styles 3. Sorbus sikkimensis *var.* ferruginea, *Wenzig in Linnæa*, 1874, 60.

BHOTAN, *Griffith.*

Branchlets with few lenticels. *Leaves* $2\frac{1}{2}$–3 in., lower half or one-third quite entire, upper surface sparsely pubescent or glabrate; nerves 6–8 pair, spreading and arching; petiole $\frac{1}{4}$ in., densely woolly. *Corymbs* densely woolly, of few primary subumbellate branches $\frac{1}{2}$–$\frac{3}{4}$ in., which are twice or thrice divided into erect stout pedicels. *Flowers* $\frac{1}{3}$ in. diam. *Calyx-tube* pyriform; lobes short, triangular, acute, very deciduous. *Petals* obovate, woolly on the face and claw. *Stamens* slender. *Disk* not raised. *Styles* usually 3, glabrous, united to the middle; ovules inserted in the middle of the axis.

22. **P. Thomsoni,** *King MSS.*; glabrous, leaves very shortly petioled, elliptic-lanceolate or -oblanceolate acuminate serrate above the middle, corymbs glabrous, styles 2–4, fruit $\frac{3}{4}$ in. diam.

SIKKIM HIMALAYA, alt. 8–10,000 ft., *J. D. H.*, *C. B. Clarke.*

A large tree; branches glabrous, sparingly lenticellate. *Leaves* 3 in., brown when dry, apparently glabrous at all stages; base acute, rarely rounded or obtuse; nerves 8–12 pair, spreading and arched; petiole $\frac{1}{4}$–$\frac{1}{3}$ in. *Corymb* of few primary subumbellate erect main branches, 1 in. long, di-trichotomously forked. *Flowers* $\frac{1}{3}$ in. diam.; pedicels slender. *Calyx-tube* pyriform; limb expanded; teeth ovate, obtuse. *Petals* obovate, claw woolly. *Stamen* stout. *Styles* stout, united at the middle or base, glabrous; ovules attached in the middle of the axis. *Fruit* with few white spots, crown sunk. *Seeds* tumid.—Young flowering specimens of this were distributed as *Photinia arguta*, Wall., var. ?, and are cited by Decaisne under his *Micromeles verrucosa* (Pyrus cuspidata, Bertol.) from which it differs in the glabrous narrow leaves with short petioles serrated only beyond the middle.

DOUBTFUL SPECIES.

P. (MALUS) SIEVERSII, *Ledeb. Fl. Alt.* ii. 222. A Soongarian species, closely allied to *P. baccata*, differing in being branched from the base, is enumerated by Decaisne (Mem. Fam. Pirus) as having been found in Kashmir by Jacquemont.

P. (MICROMELES) CASTANEIFOLIA, *Dcne. Mem. Fam. Pom.* 169; "leaves oblong or oblong-lanceolate acuminate base obtuse acutely serrate glabrous, petiole rather long slender, peduncle and pedicels floccose when young, fruit small. Sorbus sikkimensis, *Wenzig in Linnæa*, 1874, 58." Eastern Bengal, *Griffith*, No. 2077–1.—I cannot identify this.

P. (SORBUS) SIKKIMENSIS, *Wenzig in Linnæa*, 1874, 58; evidently includes more than one species from Sikkim and the Khasia Mts. Thus, var. *α.*, the Sikkim plant included under this variety, I cannot recognise by the description, though it is of a plant stated to be found by myself; the Khasia one includes *P. granulosa* and *verrucosa.*—Var. *β. oblongifolia*, this I do not recognise though it professes to be a Sikkim discovery of mine.—Var. *γ. microcarpa*, a Sikkim plant, is I suppose *P. Griffithii*, to which

Wenzig doubtfully (and erroneously) refers *P. Nussia*, Don.—Var. δ. *ferruginea* is *P. ferruginea.*

P. CRENATA. *Don, Prodr.* 237; "leaves long-petioled ovate acute crenate glabrous above, young beneath and branchlets white-tomentose, corymbs simply woolly, calyx-lobes ovate acute.—Suemba in Upper Nepal, *Hamilton*. Obs. *P. Pollveria* differs in the shorter broader serrate not crenate leaves and in the more numerous flowers."—I do not recognise the above.—Can it be the common pear?

21. PHOTINIA, *Lindl.*

Evergreen small trees or shrubs. *Leaves* coriaceous, quite entire or serrulate; stipules subulate, deciduous. *Flowers* small, corymbose, white. *Calyx-tube* obconic; limb 5-cleft; lobes short, persistent. *Petals* 5, contorted or imbricate in bud, orbicular or obovate, claw glabrous or woolly. *Stamens* 20 or more. *Ovary* with a conical pubescent or woolly crown, 2- rarely 3-celled; styles 2, rarely 3, free, or combined at the base, short; ovules 2, collateral, nearly basal in each cell, ascending. *Fruit* small, globose or ovoid, 1–2-seeded; flesh rather hard; endocarp crustaceous or membranous. *Seeds* obovoid, triquetrous or compressed, nearly as long as the fruit, testa coriaceous.—DISTRIB. Eastern tropical and subtropical Asia; species 7 or 8.

1. **P. Lindleyana,** *Wight & Arn. Prodr.* 302; quite glabrous, leaves elliptic oblong or ovate acute crenulate or entire base rounded, nerves 13–15 pair faint, petiole long stout, flowers ⅓ in. diam., claw of petal villous, fruit turbinate or subglobose. *Wight Ic.* t. 228; *Dcne. Mem. Fam. Pom.* 141. P. Notoniana, *Wall. Cat.* 671, *not of Wight & Arn.* P serrulata, *Lindl.* γ. *Wenzig in Linnæa*, 1874, 94.

NILGHIRRI HILLS, *Noton*, *Wight*, &c.

A small tree? everywhere glabrous except the crown of the ovary and claw of the petals; branches stout. *Leaves* 3–6 in., very thickly coriaceous, not shining on either surface, flat; nerves nearly horizontal; petiole 1½–2 in., cylindric. *Corymbs* 3–5 in. diam., much branched from the base, branches stout. *Flowers* ⅓ in. diam., pedicelled; bracts subulate. *Calyx-lobes* rounded. *Petals* orbicular-obovate, claw distinct. *Styles* 2, very stout, short. *Fruit* ¼ in. long, smooth, glaucous; endocarp crustaceous.—Wallich's *P. Notoniana* is only a form of *Lindleyana*, with the crenatures few and confined to near the top of the leaf.

2. **P. Notoniana,** *Wight & Arn. Prodr.* 302 (*not of Wall. Cat.*); leaves elliptic ovate oblong or lanceolate acuminate quite entire base acute or rounded, nerves very many and slender, petiole long (1–1½ in.), corymbs pubescent or glabrous, flowers ⅙ in. diam., fruit globose. *Wight Ic.* 991; *Ill.* t. 86; *Dcne. Mem. Fam. Pom.* 141; *Bedd. Fl. Sylv.* t. 192. P. Blumei, *Dcne. l. c.* 142. Eriobotrya integrifolia, *Kurz, For. Fl. Brit. Burm.* i. 442.

NILGHIRRI and PULNEY MTS., *Wight*, &c. KHASIA MTS., alt. 4–5000 ft. MARTABAN, alt. 7–7200 ft., *Kurz*. CEYLON; Central province, alt. 6–7000 ft.—DISTRIB. Java.

A small tree, glabrous except the inflorescence, which is finely pubescent. *Leaves* 2½–6 in., very variable, sometimes caudate-acuminate, thickly coriaceous, the numerous nerves very delicate, hardly shining above; petiole ¾–2 in., flat or grooved above. *Corymb* excessively branched, 3–10 in. diam.; branches slender in flower; stout in fruit. *Flowers* pedicelled, white. *Calyx-lobes* rounded. *Petals* orbicular, claw glabrous or slightly villous. *Fruit* ⅓ in. diam., blue, glaucous; endocarp membranous. *Seeds* compressed, radicular end incurved.—I refer Kurz's plant here on the authority of his citation of Beddome; he describes the leaves as sometimes cuneate-oblong and with a few inconspicuous teeth.

VAR. *ceylanica*; leaves sometimes orbicular, inflorescence quite glabrous. Ceylon, alt. 6–7000 ft.—DISTRIB. Java.—Javanese specimens have sometimes crenate leaves.

VAR. *eugenifolia*; leaves from narrow lanceolate to broadly oblong, corymbs hoary with white pubescence. P. eugenifolia, *Lindl. in Bot. Reg. sub.* t. 1956; *Wall. Cat.* 670, *in part.* P. micrantha, *Dcne. Mem. Fam. Pom.* 143.—Khasia Mts.

VAR. *macrophylla*; leaves 7–9 in. ovate-lanceolate caudate-acuminate, petiole 1–2½ in., corymbs quite glabrous. Khasia Mts.

3. **P. integrifolia,** *Lindl. in Trans. Linn. Soc.* xiii. 103; quite glabrous, leaves oblanceolate acuminate quite entire narrowed into the short (¼–½ in.) petiole, corymbs large spreading, flowers ⅙ in. diam., fruit globose. *Wall. Cat.* 669; *Lindl. in Bot. Reg. under tab.* 1956. Pyrus integerrima, *Don Prodr.* 237.

Central and Eastern Himalaya; from NEPAL, *Wallich*, and SIKKIM, alt. 4–7000 ft. to BHOTAN, *Griffith*. KHASIA MTS. alt. 3–4000 ft.

I have great difficulty in distinguishing this from *P. Notoniana* (in the Khasia Mts. especially), its best character is the very short petiole and uniformly oblanceolate smaller leaves 3–5 in. long. In the Himalaya it is very constant in its characters, but in the Khasia Mts. it comes very near small states of *Notoniana*, var. *macrophylla*. Hence though no foliage of allied plants can be more unlike in form than the ordinary states of this plant present, I am in doubt as to their specific differences. *P. integrifolia*, Miquel (Fl. Ind. Bat. i. part i. 387), from Java, appears to be the same plant. The styles are almost invariably two, but three are said to occur. The crown of the ovary is woolly, but of the fruit glabrous.

4. **P. Griffithii,** *Dcne. Mem. Fam. Pom.* 142; branchlets midrib beneath petiole and inflorescence woolly, leaves oblong-lanceolate acuminate serrulate near the tip, nerves very slender, petiole 1–2 in., flowers ⅙ in. diam. Pomarc. *Griff. Ic. Pl. Asiat.* iii. t. 573 (*bad*); *Posth. Papers*, ii. 178, No. 921.

BHOTAN HIMALAYA, at Trelagong, *Griffith*.

A large tree; branchlets rather slender, woolly, pubescence whitish. *Leaves* 5–7 by 1½–2½ in., much more membranous than in any preceding species, very finely acuminate, serratures minute, rather shining on both surfaces; nerves arched, 25–30 pair; petiole cylindric. *Corymbs* ample. *Flowers* shortly pedicelled. *Calyx-lobes* rounded. *Petals* obovate; claw woolly. *Styles* 2–3, woolly and connate below. *Ovary* with a densely woolly crown.—Griffith describes the calyx-lobes and petals as 5 or 6.

5. **P. mollis,** *Hook. f.*; branchlets leaves beneath short petiole and inflorescence clothed with white wool, leaves very membranous elliptic or lanceolate acuminate serrulate base acute, corymbs rounded many-flowered, flowers ⅓ in. diam., styles 2–3 glabrous united at the base.

SIKKIM HIMALAYA, at a low elevation, *J. D. H.*, *Gamble*.

Tree 20–30 ft. *Branches* slender, glabrous, with red brown bark and small lenticels; branchlets and other woolly parts white. *Leaves* 4–5 in., pale when dry, very membranous, serratures fewer and smaller towards the base, rather suddenly acuminate; nerves 6–10 pair, spreading, arched, very slender. *Corymbs* 2 in. diam., shortly peduncled, branches spreading, rather lax-flowered. *Flowers* white, pedicelled; bracts minute, linear, caducous, membranous. *Calyx* woolly; tube hemispheric; lobes rounded. *Petals* orbicular, retuse; claw very short, glabrous. *Stamens* not long, slender. *Disk* not thickened, woolly at the base. *Styles* slender; stigma 2-lobed. *Fruit* ⅓ in. long, ovoid, crowned with the persistent calyx; endocarp thinly crustaceous, septum membranous. Seeds nearly as long as the fruit.

22. **POURTHIÆA,** *Dcne.*

Shrubs or small trees, glabrous or woolly when young. *Leaves* simple, crenate, persistent; stipules minute, subulate. *Flowers* small, white, in few-flowered corymbs, with warted fruit-bearing branchlets. *Calyx-tube* obconic; lobes 5, acute. *Petals* 5, contorted, obovate, oblique and notched, claw glabrous. *Stamens* 20, filaments slender. *Ovary* 2–3-celled; styles 2–3, connate high up, stigma capitate 2-fid; ovules 2 in each cell, collateral, basal, ascending. *Fruit* small, globose or ovoid, 1–2-seeded, flesh granular; endocarp membranous. *Seeds* ellipsoid, plano-convex; testa thickly coriaceous with reticulated grooves on the convex side; cotyledons plano-convex; radicle curved, short, exserted.—DISTRIB. Himalaya, China, Corea, Japan.

1. **P. arguta,** *Dcne. Mem. Fam. Pom.* 147. Photinia? arguta, *Wall. Cat.* 672; *Lindl. Bot. Reg. under* 1956; *Wenzig in Linnæa,* 1874, 90, *excl. synonym.*

KHASIA MTS., alt. 3–5000 ft., abundant. BIRMA, *Griffith.* Foot of the SIKKIM Terai, *Gamble* (var. *Hookeri* only).

I can distinguish but one Indian species of this very abundant Khasian bush, which occurs all over the range; all have white-woolly young leaves and inflorescence, which is thrown off with age, the fruit varies much in size.

7074 VAR. 1. *Wallichii*; leaves $1\frac{1}{2}$–2 in. coriaceous ovate-lanceolate acuminate quite glabrous in age, nerves 8–10 pair, corymbs subsessile few-flowered sometimes almost capitate, fruit $\frac{1}{4}$ in. diam. globose. P. arguta, *Dcne. l. c.*

7076 VAR. 2. *Hookeri*; leaves 3–4 in. coriaceous oblong-lanceolate caudate-acuminate, petiole longer, corymbs 2–3 in. long, fruit $\frac{1}{3}$ in. diam. globose. P. Hookeri, *Dcne. l. c.* 148. Sikkim and Khasia.

VAR. 3. *salicifolia*; leaves 4–5 in. coriaceous narrowly lanceolate caudate-acuminate more persistently woolly beneath, corymb effuse, flowers larger. P. salicifolia, *Dcne. l. c.* 148.

VAR. 4. *membranacea*; leaves 2–3 in. very membranous ovate-lanceolate acuminate or caudate-acuminate, corymbs of few long branches floriferous at the tip. Khasia, *Griffith* (no number). This is no doubt a lax form growing in woods.

VAR. 5. *latifolia*; leaves 4–5 by $1\frac{1}{2}$–$2\frac{1}{4}$ in. rather coriaceous oblong or oblong-lanceolate acuminate more persistently woolly beneath, serratures smaller, corymbs umbelliform, branches $1\frac{1}{2}$ in., flowers longer pedicelled. Hookhoom valley, Birma, *Griffith.*

VAR. 6. *parvifolia*; leaves $1\frac{1}{2}$–$2\frac{1}{2}$ in. coriaceous narrowly lanceolate acuminate, corymbs contracted, fruit $\frac{1}{4}$ in. rather ovoid. Khasia Mts. at Jowai, *C. B. Clarke.*

23. **STRANVÆSIA,** *Lindl.*

Shrubs or small trees. *Leaves* coriaceous, evergreen, quite entire or serrulate; stipules subulate. *Flowers* small, white, in compound many-flowered corymbs. *Calyx-tube* small, obovoid; limb dilated, 5-toothed. *Petals* 5, obovate, usually contorted in bud, claw naked or bearded. *Stamens* 20. *Ovary* 5-celled; styles 5, connate high up; stigma capitate 2-fid; ovules 2 in each cell, basal, collateral, ascending. *Fruit* globose, rather fleshy, 5-celled; endocarp crustaceous, dehiscing loculicidally; cells 1-seeded. *Seeds* ovoid, plano-convex; testa coriaceous, mucilaginous; embryo plano-convex.—DISTRIB. Himalaya and China; species 3 or 4.

1. **S. glaucescens,** *Lindl. in Bot. Reg.* t. 1956; leaves obovate oblanceolate or narrowly lanceolate acuminate or obtuse and apiculate entire or serrulate quite glabrous, calyx and pedicels woolly. *Brand. For. Fl.* 210; *Wenzig*

in Linnæa, 1874, 204. S. glaucescens and S. Nussia, *Dcne. Mem. Fam. Pom.* 178. Cratægus glauca, *Wall. Cat.* 673. Pyrus Nussia, *Ham. in Don Prodr.* 237. Cotoneaster affinis, *Lindl. in Wall. Cat.* 658.

Western and Central Himalaya; KUMAON, alt. 3–7500 ft. NIPAL, *Wallich.* KHASIA MTS., alt. 4–5000 ft.

A small leafy evergreen tree, very variable in foliage, young parts tomentose in a very early state. *Leaves* in Western specimens often 6 in. long and 2–2½ broad, more obovate than is usual in the Eastern, hardly shining above, paler beneath; in Khasian specimens the leaves are sometimes 4 by ½–¾ in., long-acuminate and curved (var. *angustifolia,* Dcne.), always narrowing into the petiole; nerves very slender; petiole ½–¾ in. *Corymbs* 2–4 in. broad; branches slender, hairy or glabrate. *Flowers* pedicelled, ½ in. diam., pedicels woolly. *Calyx* woolly; lobes acute, persistent. *Petals* spreading, usually notched, not oblique. *Ovary* small; crown hardly raised, hairy. *Style*-column woolly below. *Fruit* ⅓ in. diam., orange yellow, crowned with the incurved calyx-teeth; flesh thin; crown of the crustaceous carpels exserted, glabrous.

24. CRATÆGUS, *Linn.*

Shrubs or small trees, often spiny. *Leaves* simple lobed or pinnatifid; stipules deciduous. *Flowers* in terminal corymbose cymes, white or red; bracts caducous. *Calyx-tube* urceolate or campanulate; mouth contracted; lobes 5, persistent or deciduous. *Petals* 5, inserted at the mouth of the calyx, imbricate in bud. *Stamens* many. *Carpels* 1–5, adnate to the calyx-tube; styles 1–5; stigma truncate; ovules 2 in each cell, ascending. *Fruit* ovoid or globose, with a bony 1–5-celled stone, or with 1–5 bony 1- rarely 2-seeded stones.—DISTRIB. N. temp. regions, chiefly American, extending south into New Granada; species about 50.

1. **C. Oxyacantha,** *Linn.*; *Ledeb. Fl. Ross.* ii. 88; leaves cuneate or triangular-ovate with a cuneate base pinnatifidly 3–5-lobed rarely pinnate sinus acute, lobes sharply toothed towards the tip, fruit glabrous ovoid, carpels 1–3 wholly adnate to the calyx-tube. *Brandis For. Fl.* 207. C. ribesius, *Bertol. Miscel. Bot.* xxii. 14, t. 2. (Hawthorn).

Western temperate Himalaya, from MURREE to KISHTWAR, alt. 6–9000 ft.—DISTRIB. Affghanistan and westward to the Atlantic, W. Siberia.

A small tree, 20–30 ft., trunk short, branches spinescent; young shoots and leaves beneath and inflorescence sparsely softly pubescent or glabrate. *Leaves* 1–2 in.; petiole very slender; stipules leafy, upper usually falcate, serrate, lower larger orbicular and cut. *Corymbs* many-flowered. *Flowers* ½ in. diam., white, odorous. *Calyx-lobes* subacute. *Petals* orbicular. *Styles* 1 or 2, slender, glabrous. *Carpels* adnate by their whole length to the calyx-tube, tips pubescent. *Fruit* scarlet, flesh scanty; endocarp of 2–3 bony pyrenes more or less firmly united.—Boissier regards the Himalayan plant as *C. monogyna* (itself a var. of *Oxyacantha*) but there are commonly 2 and often 3 styles and carpels.

2. **C. Clarkei,** *Hook. f.*; softly tomentose, leaves oblong pinnate or pinnatifid, base cuneate or truncate, segments oblong toothed at the broad tip, fruit pubescent globose, carpels 5, free above.

KASHMIR, at Hirpoor, alt. 8000 ft., *Thomson, C. B. Clarke.*

Pubescence soft, white, spreading. *Leaves* 2–4 in., opaque above, lower segments often free obovate and spreading, tips rounded or acute; petiole slender; stipules very large, semicircular and falcate, toothed, *Flowers* apparently smaller than in *C. Oxyacantha* and fewer in the corymb, which is clothed with spreading hairs. *Calyx-lobes* persistent, obtuse. *Petals* (from fruiting specimen) orbicular-obovate.

Styles inserted ventrally, free. *Carpels* free for nearly $\frac{1}{3}$ of the upper part from one another and the calyx-tube. *Fruit* green, 5-lobed when dry, $\frac{1}{4}$ in. diam., crowned by the reflexed calyx-lobes; pyrenes separable, free above, faces rough.—The structure of the ovary and fruit is essentially the same as in the following species, but the tops of the pyrenes are not so much protruded.

3. **C. crenulata,** *Roxb. Hort. Beng.* 38; *Fl. Ind.* ii. 509; glabrous, leaves linear-oblong or obovate crenulate obtuse very coriaceous, fruit globose, carpels 5 free above. *Wall. Cat.* 674; *Lindl. in Bot. Reg.* xxx. t. 52. C. Pyracantha, *Brandis For. Fl.* 208. Mespilus crenulata, *Don Prodr.* 238. Pyracantha crenulata, *Roem.*; *Dcne. Mem. Fam. Pom.* 171.

Temperate Himalaya in dry places from the SIRMOR to BHOTAN (exclusive of Sikkim), alt. 2500–8000 ft.

A large woody rigid spinescent shrub. *Leaves* crowded on short lateral branchlets, 1–2 in., shining, narrowed into the very short petiole; nerves indistinct. *Corymbs* short, many-flowered, glabrous or puberulous; branches slender. *Flowers* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., white; pedicels slender. *Calyx-tube* hemispheric; lobes obtuse. *Petals* orbicular, claw very short. *Styles* 5, inserted ventrally. *Carpels* 5, free for $\frac{1}{3}$ of their upper part from one another and the calyx-tube. *Fruit* globose, orange-red, crowned with the erect calyx-lobes; pyrenes separable, faces polished, upper $\frac{1}{3}$ free and protruded between the calyx-lobes.—Differs from the European *C. Pyracantha* in the obtuse leaves and smaller flowers and fruit.

25. COTONEASTER, *Linn.*

Shrubs or small trees. *Leaves* quite entire, coriaceous, usually very downy beneath; stipules setaceous, deciduous. *Flowers* small solitary or in axillary or terminal cymes, white or pink, sometimes polygamous. *Calyx-tube* turbinate or campanulate; lobes 5, short, persistent. *Petals* 5, imbricate in bud. *Stamens* 20, inserted at the mouth of the calyx. *Carpels* 2–5, adnate wholly or by their backs only to the calyx-tube; styles 2–5, free, stigma truncate; ovules 2 in each cell, erect, basal, geminate, raphe lateral. *Fruit* small, ovoid globose or turbinate, with 2–5 bony 1-seeded stones.—DISTRIB. Europe, temp. Asia; N. Africa, Mexico; species 15.

A genus distinguishable only by habit from *Cratægus*. The species are very variable and difficult of discrimination.

A. *Leaves* deciduous (subpersistent in *nummularia* and *rotundifolia*); margins not recurved.

* *Leaves* 1–4 *in. Cymes usually branched and many-flowered.*

1. **C. bacillaris,** *Wall.*; *Lindl. in Bot. Reg. under* t. 1229; a bush or small tree, leaves 1½–3 in. oblong or obovate or oblong-lanceolate woolly or glabrescent beneath acute or obtuse narrowed into the petiole, cymes short many-flowered puberulous, fruit dark brown globose. *Brandis For. Fl.* 208; *Wall. Cat.* 660. C. obtusa, *Wall. in Bot. Reg. l. c.*; *Cat.* 659, *in part.*

Temperate Himalaya, from WAZARISTAN, alt. 4–8000ft.; MURREE and KASHMIR, alt. 4–10,000 ft. to NEPAL, SIKKIM? and BHOTAN?. SALT. RANGE, alt. 1500–2500 ft. (*Brandis*).

A common and variable deciduous Himalayan shrub; wood much used for walking sticks, whence its specific name. Of Wallich's *C. obtusa*, I cannot distinguish three of the specimens from *bacillaris* even as a variety; Lindley's character of "cymes congested and branchlets glabrous" in *obtusa*, and "cymes divaricate and branchlets pilose" in *bacillaris*, do not distinguish Wallich's var. The other specimens marked

as *obtusa* are the *C. affinis* of Lindley and differ only in the tomentose undersurface of the leaves and corymbs, which in this respect present every intermediate with *bacillaris*; its leaves are however often smaller rounder and sometimes rounded at the base (*C. rosea*, Edgw.). I am somewhat doubtful of the Sikkim and Bhotan plants here referred to *bacillaris*. I do not remember a black or dark brown fruited large shrubby species in Sikkim, and Griffith's Bhotan specimens are in flower only; one of these has leaves under 1 in. long. The Sikkim specimens doubtfully referred here have the leaves of *affinis* and a young shoot has them sometimes almost orbicular, rounded at the base (as in *rosea*) and 2 in. diam. Except by the dark berries it is difficult to distinguish var. *affinis* from *C. frigida*.

VAR. *affinis*; leaves beneath petioles young shoots and inflorescence more or less woolly or tomentose. C. affinis, *Lindl. in Trans. Linn. Soc.* xiii. 101; *Bot. Reg. under* t. 1229. C. obtusa, *Wall. Cat.* 659, in part. C. rosea, *Edgw. in Trans. Linn. Soc.* xx. 46. Mespilus affinis, *Don Prodr.* 238.

VAR. *parvifolia*; leaves $\frac{1}{3}$–1 in. elliptic acute or obtuse, cymes short dense-flowered, flowers smaller. Bhotan, *Griffith*, alt. 7000 ft.

2. **C. frigida,** *Wall. Cat.* 657; a large bush or small tree, leaves 3–5 in. oblong or oblong-lanceolate acute narrowed to the base young tomentose beneath, cymes very many-flowered woolly, fruit globose scarlet. *Lindl. in Bot. Reg.* t. 1229. ? C. affinis, *Hohen. Plant. Exsicc. Nilg.* No. 1575. C. nepalensis, *Hort.*

Central and Eastern Himalaya; NIPAL, *Wallich*, interior of SIKKIM, alt. 7–9000 ft., *J. D. H.*

A tree, 20 ft. high, or large bush, deciduous, similar in habit and foliage to *C. bacillaris*, but with far more numerous flowers in a cyme and scarlet berries. Hohenacker's Nilgiri specimens, which I take to be *frigida*, are from a tree cultivated in Lord Elphinstone's garden at Kaitee. Decaisne quotes Jacquemont as having found this, but I suspect that *C. bacillaris* var. *affinis* is the plant intended, as *C. frigida* occurs nowhere in Jacquemont's region of travel.

** *Leaves* $\frac{1}{2}$–*2* (*rarely* 4–5) *in. Cymes few-flowered or flowers solitary.*

3. **C. acuminata,** *Lindl. in Trans. Linn. Soc.* xiii. 101, t. 9; an erect shrub, twigs leaves beneath and inflorescence pubescent or tomentose, leaves usually 1–2 in. ovate acuminate or acute at length glabrous beneath, cymes 1–5-flowered very short, fruit turbinate scarlet. *Brandis For. Fl.* 209. R. Roylei *or* Royleana, *Hort.* C. rotundifolia, *Herb. Str. & Wint., not of Wallich.* Mespilus acuminata, *Lodd. Bot. Cat.* t. 919.

Temperate Himalaya, from SIRMOR and KUMAON, alt. 4500–12,000 ft., to SIKKIM, alt. 7–13,000 ft.

A deciduous shrub, sometimes 14 ft. high; wood used for walking sticks (like *bacillaris*), the most constant in form of foliage of any Indian species except *Simondsii*, also in their size, about 2 in., though in one of Wallich's specimens they exceed 5 in.!—The fruit varies from turbinate to subcampanulate. The number of flowers in a cyme varies extremely, Brandis says from 2–10, I find 2–5 the average, but solitary flowers are not uncommon.

4. **C. vulgaris,** *Lindl.*; *Boiss. Fl. Orient.* ii. 665; an erect bush, leaves $\frac{3}{4}$–$1\frac{1}{2}$ rarely 2 in. broadly ovate acute or obtuse hoary or glabrous above softly tomentose beneath, cymes short few-flowered glabrescent, fruit globose black or red.

WESTERN TIBET and WAZURISTAN, alt. 5–11,000 ft.—DISTRIB. Siberia, Soongaria, Persia Westward to the Atlantic.

Usually a slender erect deciduous shrub, varying much in form of foliage and pubescence of both surfaces; its habit, more ovate leaves, and fewer flowered cymes, best

distinguish it from *C. nummularia.* In lax specimens the cymes have slender peduncles and pedicels and drooping flowers. The character of drooping fruit by which it has been sought to distinguish these two species depends on the length of the peduncle. *Fruit* very variable in size and colour. Specimens apparently of *C. vulgaris*, from Bargil, Kashmir, alt. 10,500 ft. collected by Mr. C. B. Clarke have leaves 2 in. long.

5. **C. multiflora,** *Bunge*; *Led. Fl. Ross.* ii. 93; an erect slender bush, leaves $\frac{3}{4}$–2 in. ovate elliptic or obovate acute obtuse or rounded at the tip thin glabrous above, glaucous and glabrous or faintly silky beneath, petiole slender, cymes 3–10-fid on short or long peduncles nearly glabrous. *Dcne. Mem. Fam. Pom.* 174. Cotoneaster 6, *Herb. Strach. & Wint.*

KASHMIR, *Jacquemont*; NITI PASS KUMAON, alt. 11,500 ft. *Strach. & Winterb.*—DISTRIB. Altai, Persia, Soongaria.

I refer the Garwhal plant to Bunge's *multiflora* with some hesitation; it closely resembles the Altai and Soongaria plant in its thin pale leaves glaucous beneath, but they are usually ovate and acute whereas in the Altai and Soongarian ones they are orbicular obovate or obcordate; there are however leaves on some specimens of the Himalayan plant quite like those of the other in being broadly elliptic and rounded at both ends, and Baikal specimens have all the leaves ovate acute. I have seen but few Indian specimens.

6. **C. nummularia,** *Fisch. & Mey.*; *Boiss. Fl. Orient.* ii. 666; a straggling or prostrate bush with woody often divaricate branches, leaves $\frac{1}{3}$–$1\frac{1}{3}$ in. orbicular or obovate obtuse or retuse or apiculate white or densely silkily woolly beneath, cymes woolly very short 2–5-flowered, flowers crowded, fruit small obovoid globose black. *Brandis For. Fl.* 209. C. Lindleyi, *Steud.*; *Dcne. Mem. Fam. Pom.* 176.

WESTERN TIBET and KASHMIR, alt. 6–11,000 ft.—DISTRIB. Soongaria, Affghanistan and Westward to Asia Minor.

A smaller subevergreen, more woody rigid species than *C. vulgaris*, with smaller leaves sometimes only $\frac{1}{4}$ in. long, never ovate and often orbicular. *Flowers* small; calyx usually tomentose but sometimes glabrate; fruit black, erect.—Cultivated specimens have orbicular leaves nearly 1 in. diam., and almost glabrous beneath. I do not know upon what grounds Steudel and Decaisne regard the *nummularia* of London which appears to me to be the true plant, as different from that of Fischer.

7. **C. rotundifolia,** *Wall. Cat.* 663; a low rigid horizontally and distichously branched shrub, leaves $\frac{1}{3}$–$\frac{1}{2}$ in. distichous orbicular or orbicular-obovate mucronate glabrous or sparsely hairy above and beneath, flowers solitary subsessile, fruit turbinate scarlet. *Lindl. in Bot. Reg. under* t. 1229; *Saunders Refug. Bot.* i. t. 54. C. microphylla, *var.* uva-ursi, *Lindl. in Bot. Reg.* t. 1187. C. prostrata, *Baker in Saunders Refug. Bot.* i. t. 53.

Central and Eastern Himalaya, alt. 9–11,000 ft.; from NIPAL, *Wallich*, to SIKKIM, *J. D. H.*, &c., and BHOTAN, *Griffith*.

A rigid shrub, remarkable for its almost horizontal branches and regular small orbicular mucronate leaves, which are not woolly or downy, but have sparse appressed hairs, they are very coriaceous, often a little recurved, and are subpersistent in England; but as in Wallich's specimens they are all but fallen off, this character probably depends on the severity of the winter. Decaisne (*Mem. Fam. Pom.* 176) refers to this *C. nepalensis*, *alpina* and *Roylei* of gardens, but our *Roylei* is certainly *C. acuminata*. Baker's *C. prostrata* from Saunders' garden is identical with specimens of *rotundifolia* from the Hort. Soc. Gardens in Herb. Bentham, and has the peculiar appressed hairs of the twigs and under surface of the leaves of *rotundifolia*, from which I cannot distinguish it.

8. **C. Simondsii,** *Hort.*; *Baker in Saunders Refug. Bot* i. t. 55; an erect bush with slender branches, leaves $\frac{3}{4}$ in. subdistichous rhombic-orbicular

acuminate glabrous above sparsely silky beneath, nerves distinct, margins subrecurved, flowers solitary or twin subsessile, fruit turbinate scarlet. C. acuminata, *var.* Simondsii, *Dcne. Mem. Fam. Pom.* 175.

KHASIA MTS.?

The origin of this is unknown. It is probably named after Mr. Simons who collected largely in the Khasia Mts. and who may have sent seeds to England from thence or from Bhotan. It is remarkable that it occurs in no Indian Herbarium, but so would be the fact, that except this be a native of the Khasia, that range should possess no *Cotoneaster.* It very nearly resembles *C. rotundifolia.*

B. Leaves persistent, rigid, $\frac{1}{3}$ in. long; margins recurved. Flowers almost always solitary. (See also *C. nummularia, rotundifolia* and *Simondsii.*)

9. **C. microphylla,** *Wall. Cat.* 662 A.; a low ramous woody intricately branched shrub, leaves $\frac{1}{3}$ in. ovate or obovate acute retuse or obtuse glossy above pubescent or tomentose beneath, margins recurved, flowers $\frac{1}{2}$ in. diam., fruit globose scarlet. *Lindl. in Bot. Reg.* t. 1114; *Saunders Refug. Bot.* i. *t.* 49; *Brandis For. Fl.* 209. C. emarginata, *Hoffm. according to Decaisne, Mem. Fam. Pom.* 176. ? C. buxifolia, *Baker in Saunders Refug. Bot.* i. t. 52.

Temperate Himalaya, alt. 4–8000 ft. from KASHMIR to BHOTAN;—var. *glacialis* from 9–14,000 ft.

In a dried state it is very difficult to distinguish this from the following, and from single flowered states of *C. buxifolia.* I suspect that the *C. buxifolia* of Saunders' Refugium is a state of this, though it may be a 1-flowered state of *buxifolia.*

VAR. *glacialis*; leaves glabrous and glaucous beneath, flowers smaller often pink. C. congesta, *Baker in Saunders Refug.* i. t. 51.

10. **C. thymifolia,** *Hort.*; *Baker in Saunders, Refug. Bot.* i. t. 50; an almost prostrate woody intricately branched shrub, leaves $\frac{1}{4}$–$\frac{1}{3}$ in. cuneate-obovate or oblong tip rounded or retuse glossy above pubescent or tomentose beneath, margins recurved, flowers solitary $\frac{1}{3}$ in. diam., fruit small globose scarlet. C. microphylla, *Wall. Cat.* 662, B. Cratægus integrifolia, *Herb. Ham.*

Temperate and Alpine Himalaya from KASHMIR, *Falconer*, to SIKKIM, *J. D. H.*

This so resembles certain states of *C. microphylla*, that I retain it as a species with great doubt; in habit the two are identical, but *C. thymifolia* has narrower leaves that are never elliptic or ovate or acute, but always broader upwards and rounded or retuse at the tip; the flowers are smaller, but this is not a character of much value. It was distributed with true *microphylla* by Wallich and with *buxifolia* by Strachey and Winterbottom from Nynee Tal.

11. **C. buxifolia,** *Wall. Cat.* 661; a small rigid intricately branched woody bush, leaves $\frac{1}{3}$ in. elliptic-ovate acute or apiculate dull not shining and often pubescent above densely tomentose beneath, margins recurved, cymes 2–6-flowered tomentose short, fruit globose scarlet. *Wight Ic.* t. 992; *Beddome Fl. Sylvat. Anal. Gen.* xcvii. t. 13, f. 3. C. affinis, *DC. Prodr.* ii. 632 (*the Nilghiri plant*). C. lanata, *Hort.*; *Regel Gartenfl.* ix. 59.

Western Peninsula, NILGHIRI and PULNEY MTS. ? Temperate Himalaya from SIRMORE, alt. 4–7000 ft. to BHOTAN, alt. 10,000 ft., *Griffith.*

I have under *C. microphylla* stated that it is difficult to distinguish dried single-flowered specimens of this from that plant, though in their ordinary states they are very different, *C. buxifolia* having an opaque and often hoary or hairy upper surface to the leaf, which is more regular in shape, and several-flowered cymes, with smaller flower and fruit. I am in great doubt as to any of the Himalayan specimens referred to this being other than 2–3-flowered states of *microphylla.* The *C. lanata* of Lindley

is a garden state with rather larger leaves and long branches, both due to alteration in habit induced by culture. Decaisne refers Hohenacker's Nilghiri specimen (n. 1154) to *lanata*, saying that it is not Wallich's plant, but Wallich's and Hohenacker's specimens are identical in characters and might have come from the same branch; and there is certainly but one species known from the Nilghiris; he further describes the leaves of *lanata* as deciduous, whereas those of *buxifolia* are supposed to be persistent. Decaisne (Mem. Fam. Pom.) gives the synonym of *C. lanata* as a species of Lindley's, but I do not find it alluded to elsewhere, except as a garden name. It is cultivated at Kew, and differs from ordinary *C. buxifolia* only in its greater development.

ORDER LII. **SAXIFRAGACEÆ.** (By C. B. Clarke.)

Trees shrubs or herbs. *Leaves* alternate and exstipulate, or stipules adnate to the base of the petiole, or opposite and exstipulate. *Inflorescence* various; flowers hermaphrodite or polygamo-diœcious, the sepals petals and stamens symmetrically regular. *Calyx* more or less adnate to the ovary, sometimes nearly free, sometimes quite inferior; lobes imbricate or valvate *Petals* 5 or 4, rarely 0, perigynous or epigynous, rarely subhypogynous, imbricate or valvate. *Stamens* inserted with the petals, equalling or double their number, rarely numerous; staminodes or glands sometimes present between the stamens and the ovary. *Ovary* of 2 or 3–5 carpels; usually 2- or 3–5-celled with axile placentæ, less commonly 1-celled with parietal placentæ; styles as many as the carpels, distinct or combined nearly to the summits, stigmas capitate or lateral and subcapitate; ovules numerous, anatropous, erect or pendulous. *Fruit* capsular or berried. *Seeds* numerous or several (solitary in *Polyosma*) albuminous; the albumen rarely scanty or nearly wanting.—DISTRIB. Species 540; in the cold or temperate regions of the whole world and in the mountains of the tropics; together with a few genera of tropical trees.

Saxifragaceæ is now extended to contain *Saxifraga* on one side, *Ribes* on another, and the tropical *Itea* and *Polyosma* between; and thus has become very difficult of definition. *Crassulaceæ* are generally recognised by their fleshy habit and distinct carpels. *Rosaceæ* are separated by no absolute line; *Astilbe* in *Saxifragaceæ* touching *Spiræa* in *Rosaceæ*.

TRIBE I. **Saxifrageæ.** *Herbs.*

* *Ovary 2-celled.*

Leaves twice ternate more than a foot long . . . . 1. ASTILBE.
Leaves simple . . . . 2. SAXIFRAGA.

** *Ovary 1-celled.*

Flowers solitary. Petals 5. Leaves opposite . . . . . . 3. VAHLIA.
Flowers racemose. Petals 5, minute . . . . 4. TIARELLA.
Flowers solitary. Petals 0. Leafy small plants . . . . 5. CHRYSOSPLENIUM.
Scapes 1-flowered. Petals 5. Staminodes prominent . . . 6. PARNASSIA.

TRIBE II. **Hydrangeæ.** *Shrubs* or trees. *Leaves* opposite, exstipulate, simple. *Stamens* double the number of petals or more numerous. *Ovary* inferior or half-superior.

* *Stamens* 8, 10 *or* 12.

Filaments linear. Fruit capsular . . . . 7. HYDRANGEA.
Petals falling off in a cap. Glabrous . . . . 8. PILEOSTEGIA.
Petals expanding. Berry blue . . . . 9. DICHROA.
Filaments winged . . . . 10. DEUTZIA.

** *Stamens* 20–40 . . . . 11. PHILADELPHUS.

TRIBE III. **Escallonieæ.** *Trees* and shrubs. *Stamens* equalling the petals in number. *Ovary* inferior or half-superior.

Leaves alternate. Seeds numerous . . . . 12. ITEA.
Leaves opposite. Seeds solitary . . . . 13. POLYOSMA.

TRIBE IV. **Ribesieæ.** *Shrubs. Leaves* alternate, simple. *Ovary* inferior, 1-celled. *Seeds* immersed in pulp.

Flowers racemose or subsolitary . . . . 14. RIBES.

1. ASTILBE, *Ham.*

Erect herbs with a perennial creeping rootstock. *Leaves* alternate, twice or thrice ternate; leaflets doubly serrate with prominent veins; stipules large, adnate to the petiole, sheathing. *Flowers* (sometimes polygamous) small, in a terminal panicle, spicate-racemose. *Calyx* slightly adnate to base of ovary with 5 (rarely 4) imbricate lobes. *Petals* 5 or 0 (rarely 4) perigynous. *Stamens* 10 or 5 (rarely 8) perigynous. *Carpels* 2, united below, narrowed upwards into a short style; stigmas small capitate; ovules numerous axile. *Ripe carpels* dry, acuminate or acute at the top, divaricating, dehiscing ventrally. *Seeds* small, narrow, oblong, tailed at both ends.—DISTRIB. Species 3 or 7; from the Himalaya, Java, Mantchuria, Japan and Virginia.

1. **A. rivularis,** *Ham. in Don Prodr.* 211; flowers green-yellow, petals 0, stamens 5 opposite the sepals, ripe carpels deflexed. *DC. Prodr.* iv. 51. Spiræa barbata, *Wall. Cat.* 705; *Camb. in Jacq. Voy. Bot.* t. 58.

TEMPERATE HIMALAYA, from KASHMIR to BHOTAN, alt. 5000–9000 ft., abundant. KHASIA MTS., alt. 4000–6000 ft., very common.

Stem and *leaves* with long fulvous hairs, especially about base of the petioles. *Leaflets* 1–4 in., ovate, acuminate, often cordate at the base, generally scabrous on the nerves on both surfaces. *Rachis* of panicle woolly-pubescent, and brown-villose; pedicels short with a small bract at the base. *Sepals* green, subglabrous, oblong, obtuse, erect, $\frac{1}{8}$ in. Young *carpels* but slightly united. *Ripe carpels* $\frac{1}{3}$ in. long. *Seeds* numerous.—*Spiræa triternata*, Wall. Cat. 708 is reduced to *Astilbe rivularis* by *H. f. & T. in Journ. Linn. Soc.* ii. 74, but every Wallichian specimen is referable to *Spiræa Aruncus*, L. which in fruit requires to be carefully distinguished from *Astilbe* by the carpels, suddenly narrowed at top into short divergent beaks, usually 3–4 in number, with few larger and much less tailed seeds. *Astilbe speciosa* Junghuhn (*Miq. Flor. Ind. Bat.* i. pt. i. 393) differs from *A. rivularis* by the flowers often 4-fid, the stamens 8 or 10, the ripe carpels broader at the base.

2. **A. rubra,** *H. f. & T. in Bot. Mag.* t. 4959; petals 5 pale pink linear or linear-spathulate twice or thrice the sepals in length, stamens 10, the 5 opposite the petals shorter, ripe carpels suberect.

KHASIA MTS., alt. 4000–6000 ft., *Griffith*, &c.

Stems and *leaves* with long fulvous hairs, especially about base of the petioles. *Leaflets* 1–3 in., ovate, acute, sometimes cordate at the base, generally scabrous on the nerves on both surfaces. *Rachis* of panicle woolly-pubescent and brown-villose; pedicel short with a small bract at the base. *Sepals* $\frac{1}{8}$ in., green, subglabrous, oblong, obtuse, erect. Young *carpels* united for a great portion of their length. *Ripe carpels* $\frac{1}{4}$ in. long.—*A. japonica, Morr. & Decne*; *A. Thunbergii, Maxim.*; and *A. chinensis, Maxim.*, differ by being more slender and less villose.

EXCLUDED SPECIES.

A. Stoliczkai, Kurz in Seem. Journ. Bot. v. 240 with simple leaves, from the North West Himalaya probably does not belong to the genus; may be a *Spiræa*.

2. SAXIFRAGA, *Linn.*

Herbs, mostly small perennials. Radical *leaves* often rosulate; stem leaves alternate (in Sect. *Porphyrion* subopposite), exstipulate, petiole sheathing at base. *Flowers* corymbose or paniculate or reduced to 3–1; white or yellow, rarely red. *Calyx* adnate to the ovary at base (rarely free) 5-fid, imbricate. *Petals* 5, perigynous. *Stamens* 10 (rarely 5) perigynous. *Carpels* 2 (very rarely 3–5) united below, narrowed upwards into a style, stigma lateral subcapitate; ovules numerous, axile. *Ripe Carpels* dry, opening at the top ventrally. *Seeds* small, ellipsoid in Indian species.—DISTRIB. Species 160, almost all in the Northern Hemisphere; inhabiting cool temperate, and especially alpine, localities.

SECT. I. **Nephrophyllum.** *Calyx* adnate to the base of the ovary, lobes erect in fruit. *Petals* white, much exceeding the calyx. *Stems* erect leafy. *Radical* leaves petioled, reniform, lobed. *Bracts* 2, unequal at base of peduncles. —In the Indian species the surculi are represented by bulbils, covered with fulvous hairs, forming a cluster at the base of the stem.

1. **S. odontophylla,** *H. f. & T. in Journ. Linn. Soc.* ii. 64; no bulbils in the upper axils, radical leaves crenate with 7–12 shallow rounded lobes, lobes of stem-leaves often triangular acute. *Wall. Cat.* 454, *partly.* S. asarifolia, *Sternb. Saxifrag. Suppl.* t. 24.

WESTERN TEMPERATE HIMALAYA, alt. 10,000 ft.; Kumaon, *Blinkworth*; Kulu, *Edgeworth*; Gurwhal, *Falconer*; Lahul, *Jaeschke.*

Laxly villose, 6–10 in. high. *Flowers* 3–6. Upper *leaves* few, sometimes 0. In the ripe *fruit* the calyx-tube is short campanulate or funnel-shaped; the lobes are ovate-linear, approximate, with acute sinuses.—This species bears a general resemblance to *S. granulata,* but the calyx in fruit is very different. It is more difficult to separate it from *S. sibirica.* Engler (*Monog. Saxifrag.* 99) has taken *Sternb. Saxifrag. Suppl.* t. 25 as the type of *S. odontophylla,* which should rather be referred to *S. sibirica.*

2. **S. sibirica,** *Linn.*; *DC. Prodr.* iv. 36; no bulbils in the upper axils, radical leaves with 5–7 acute or obtuse lobes, upper stem leaves often simple entire oblong or ovate acute. *Sternb. Rev. Saxifrag.* t. 25, f. 1; *H. f. & T. in Journ. Linn. Soc.* ii. 64; *Boiss. Fl. Orient.* ii. 807; *Engler Monog. Saxifrag.* 101. S. odontophylla, *Wall. Cat.* 454, *partim.*

WESTERN HIMALAYA and KASHMIR, alt. 9000–14,000 ft., frequent; *Royle, Falconer, T. Thomson,* &c.—DISTRIB. From Kashmir to the Caucasus and to the Altai.

Stem pubescent, 6–8 in high. *Flowers* 1–10. *Calyx-tube* in the ripe fruit short, campanulate or funnel-shaped; lobes ovate-linear, sinuses narrow. *Seeds* oblong, subangular, quite smooth, testa minutely reticulate. *Flowers* and capsules smaller than those of *S. odontophylla.* All the Indian specimens referred to *S. granulata,* Linn. by *H. f. & T. in Journ. Linn. Soc.* ii. 63 are here reduced to *S. sibirica.* In the ripe fruit of *S. granulata* the calyx is divided only about half way down, the tube is hemispherical, the lobes are oblong distant with rounded sinuses.

3. **S. cernua,** *Linn.*; *DC. Prodr.* i. 36; bulbils in the upper axils, flower often terminal solitary all the lower flowers of the raceme being replaced by sessile purple bulbils, or flowers 2–3 pedicelled. *Eng. Bot.* t. 664; *Don in Trans. Linn. Soc.* xiii. 364; *H. f. & T. in Journ. Linn. Soc.* ii. 63; *Engler Monog. Saxifrag.* 106.

WESTERN HIMALAYA and WESTERN TIBET, alt. 14,000–17,000 ft.; N. of Ladak, *T. Thomson, C. B. Clarke*; Nubra, *Strachey*; Tanglang Pass, *Heyde.*—DISTRIB. Alps of Europe, Temperate and Arctic N. America and W. Asia.

Stem 4–6 in. high. Radical *leaves* reniform, palmately 4–6-lobed; upper leaves 3–1-fid passing into bracts. *Calyx-tube* in the ripe fruit short, campanulate or funnel-shaped; lobes ovate-linear, approximate, with acute sinuses.—Turczanimow judiciously remarks (*Fl. Baikal-Dahur.* i. 454) that the only reason for not treating *S. cernua* as a var. of *S. sibirica* is its much wider geographical range. The very imperfect specimens collected by Strachey and Winterbottom in Kumaon and referred to *S. orientalis*, Jacquem., by H. f. & T. doubtfully in *Journ. Linn. Soc.* ii. 63 are certainly not *S. orientalis* nor any species of the section *Cymbalaria*; they have bulbils in the upper axils and belong perhaps to *S. cernua*, *β. pauciflora*, Sternb.

SECT. II. **Hirculus.** *Sepals* nearly free, in fruit patent or reflexed. *Petals* yellow, often with 2–4 spots near their base. *Stems* erect leafy. *Leaves* entire withering not deciduous, lower petioled, upper sessile more or less stem-clasping.—DISTRIB. All Himalayan; *S. Hirculus* extending thence to Europe and North America.

* *Stem leaves loosely overlapping each other.*

4. **S. palpebrata,** *H. f. & T. in Journ. Linn. Soc.* ii. 67; densely tufted, stems 1-flowered, stem-leaves oblong narrower at the base, calyx half adnate to the ripe fruit, petals obovate. *Engler Monog. Saxifrag.* 119.

SIKKIM, alt. 13,000–15,000 ft.; Tunkra Pass, *J. D. H.* KUMAON, alt. 13,000 ft., Ralum, *Strachey & Winterbottom.*

Stems 2–5 in. high. *Leaves* ciliate; the lowest radical leaves spathulate, obtuse or orbicular; cauline ½ in. *Styles* exceedingly short. *Ripe carpels* hardly equalling the sepals. *Seeds* trigonous, ellipsoid, smooth,

5. **S. cordigera,** *H. f. & T. in Journ. Linn. Soc.* ii. 68; tufted, stems 1-flowered, cauline leaves cordate-ovate, calyx slightly adnate to the ripe fruit, the lobes patent, petals obovate. *Engler Monog. Saxifrag.* 119.

SIKKIM and EAST NIPAL, alt. 12,000–15,000 ft.; Yeumtong and Kambachen, *J. D. H.*; Yakla Pass, *C. B. Clarke.*

Stems 2–4 in. high. *Leaves* ciliate; lowest radical spathulate, obtuse or orbicular; cauline ⅓ in. *Styles* exceedingly short. *Ripe carpels* hardly equalling the sepals. *Seeds* ellipsoid, angular, smooth, testa lax somewhat plaited.

6. **S. Lychnitis,** *H. f. & T. in Journ. Linn. Soc.* ii. 68; tufted, stems 1-flowered, calyx little adnate to the ripe fruit, sepals densely brown-pubescent, petals elongate-spathulate 3-nerved. *Engler Monog. Saxifrag.* 120.

SIKKIM, alt. 14,000–16,000 ft., Lama Kongra, *J. D. H.* KUMAON, alt. 14,700 ft.; Barji Kang Pass, *Strachey & Winterbottom.*

Glandular-pubescent. *Stems* 1–5 in. high. Radical *leaves* spathulate-ovate; cauline ⅓–¼ in., linear-oblong or elliptic. *Petals* ½–1 in. long. *Styles* very short. *Carpels* hardly equalling the sepals. *Seed* trigonous, ellipsoid, smooth.

7. **S. viscidula,** *H. f. & T. in Journ. Linn. Soc.* ii. 69; stems 3–1-flowered, calyx slightly adnate to the ripe fruit, sepals glandular little pubescent, petals spathulate-oblong 7–5-nerved. *Engler Monog. Saxifrag.* 120.

SIKKIM, alt. 13,000–15,000 ft., *J. D. H.*

Glandular-pubescent. *Stems* 3–4 in. high. Radical *leaves* spathulate-lanceolate; cauline ½ in., oblong, subacute. *Pedicels* ¼ in. long. *Petals* ½ in. long. *Styles* not very short.

** *Upper stem leaves narrow linear, little overlapping each other; stems 1-flowered.*

8. **S. aristulata,** *H. f. & T. in Journ. Linn. Soc.* ii. 68; tufts mosslike, stems $1\frac{1}{2}$–3 in. glandular but not woolly-pubescent upwards, leaves with recurved margins and terminated by a deciduous linear awn, petals broadly obovate. *Engler Monog. Saxifrag.* 121.

SIKKIM, alt. 13,000–18,000 ft.; Yeumtong and Lachen, *J. D. H.*
Stem-leaves $\frac{1}{3}$ in., shining, glabrous. *Sepals* glabrous, slightly adnate to the ripe carpels. *Petals* $\frac{1}{4}$–$\frac{1}{3}$ in. long.
VAR. 2; stem-leaves much larger lanceolate-linear somewhat overlapping each other.—Sikkim, Samdong, *J. D. H.* This variety approaches *S. brachypoda*, Don.

9. **S. saginoides,** *H. f. & T. in Journ. Linn. Soc.* ii. 68; tufts mosslike, stems 1 in. woolly-pubescent upwards, leaves striate but hardly with recurved margins rarely terminated by a deciduous awn, petals oblong. *Engler Monog. Saxifrag.* 121.

SIKKIM, alt. 10,000–18,000 ft.; Lachen, &c., *J. D. H.* KUMAON, alt. 13,000 ft.: Ralum, *Strachey & Winterbottom.*
Stem-leaves hardly $\frac{1}{4}$ in. long, glabrous. *Sepals* glabrous, slightly adnate to fruiting carpels. *Petals* scarcely $\frac{1}{4}$ in. long. *Fruit* small. *Seed* trigonous, subglobose, smooth.—Hardly to be distinguished from *S. aristulata*. Moreover Sir J. D. Hooker collected in Sikkim intermediate forms having the woolly pubescent peduncle of *S. saginoides*, with the leaves and stature of *S. aristulata*.

*** *Upper stem-leaves not overlapping each other; flowers corymbose, rarely reduced to one in starved examples.*

10. **S. latiflora,** *H. f. & T. in Journ. Linn. Soc.* ii. 71; flowers 3–1 large, sepals ovate herbaceous large, radical leaves smaller than the stem-leaves. *Engler Monog. Saxifrag.* 122.

SIKKIM, alt. 13,000 ft.; Kankala, *J. D. H.*
Stems 4–8 in. high, glabrous below, glandular-pubescent above. *Leaves* oblong-elliptic; radical petiolate, glandulose-ciliate; cauline $1\frac{1}{2}$ by $\frac{1}{2}$–1 in. *Petals* ovate-oblong, naked at the base, a little exceeding the sepals. *Styles* very short. *Capsule* ovate-oblong.—Resembles *S. diversifolia* but has finer flowers.

11. **S. Hirculus,** *Linn.*; *DC. Prodr.* iv. 44; surculi decumbent, leaves subglabrous radical petioled narrow-spathulate cauline oblong narrowed at both ends, flowers 3–1, petals narrow obovate. *Eng. Bot.* t. 1009; *Don in Trans. Linn. Soc.* xiii. 372; *H. f. & T. in Journ. Linn. Soc.* ii. 69; *Boiss. Fl. Orient.* ii. 808; *Engler Monog. Saxifrag.* 122.

VAR. 1. *typica*; stems 6–12 in. 1–3-flowered, cauline leaves $\frac{1}{2}$–1 in., sepals strongly deflexed, base often brown-villous externally, petals 2–3 times the sepals golden with red dots and 2 pits at the base, styles very short. Not yet collected in India.—DISTRIB. Arctic regions; Alps of Europe to the Caucasus.
VAR. 2. *indica*; peduncles very brown villous, capsule much shorter oval-oblong, sepals hardly deflexed even on the ripe fruit, petals shorter 1–2 times the calyx, styles often wanting, with no obvious stigmas, but the capsules produce good seed.—North Kashmir to Sikkim, alt. 11,000–17,000 ft., *Falconer*, *T. Thomson*, *J. D. H.*, &c.
VAR. 3. *hirculoides* (*sp.*) *Dcne. in Jacq. Voy. Bot.* t. 78; stems 2–3 in. often very villous upwards; like var. 2 but the petals have no pits or glands at the base and are shorter than sepals, or scarcely exceed them.
Kashmir, *Jacquemont*. Western Tibet, alt. 17,000 ft.; Balch Pass, *Strach. & Winterb.*
VAR. 4. *subdioica*; like var. 3, but the stems are 3–6 in. high, and carry 4–10 shortly corymbose or altogether congested flowers; the stigmas are obscure and some

of the flowers seem functionally male, though in others with no visible stigmas there are perfected seeds. S. Hirculus, var. γ. *H. f. & T. in. Journ. Linn. Soc.* ii. 69.

Western Tibet; *Falconer*; Lanak Pass, alt. 15–17,000 ft., *T. Thomson.*

12. **S. nutans,** *H. f. & T. in Journ. Linn. Soc.* ii. 69; pedicels short, flowers 6–12 subracemose nodding, sepals with black glands and densely pubescent. *Engler Monog. Saxifrag.* 124.

SIKKIM, alt. 10,000–12,000 ft., *J. D. H.*

Stem 5–10 in. high, densely glandular-pubescent upwards. *Radical leaves* petioled, oblong, obtuse; cauline about 1 in., sessile, broadly oblong. *Petals* pale yellow, spathulate, 1½ times the calyx. *Styles* short.

13. **S. diversifolia,** *Wall. in Sternb. Saxifrag. Suppl.* t. 22; flowers corymbose rarely 3–2, sepals ovate-oblong small, cauline leaves sessile often cordate and amplexicaul, radical leaves long-petioled often large. *Wall. Cat.* 452; *DC. Prodr.* iv. 44; *Hook. Lond. Journ. Bot.* iv. t. 21; *H. f. & T. in Journ. Linn. Soc.* ii. 70; *Engler Monog. Saxifrag.* 125. S. parnassifolia, *Wall. Cat.* 451, *partly*; *Don in Trans. Linn. Soc.* xiii. 405; *DC. Prodr.* iv. 25; *Sternb. Saxifrag. Suppl.* t. 25. S. Moorcroftiana, *Wall. Cat.* 453; *Sternb. Saxifrag. Suppl.* t. 24. S. lysimachoides, *Klotzsch in. Reis. Pr. Waldem. Bot.* t. 42.

Alpine Himalaya; from KASHMIR to BHOTAN, alt. 9000–17,000 ft., abundant.

Stems 8–18 in. high, leafy, glandular, often finally glabrous. *Radical leaves* long-petioled, narrowed into the petiole or (var. *parnassifolia*) ovate, subcordate; cauline ½–2 in., ovate or broad oblong. *Sepals* at length reflexed. *Petals* with 4 stalked glands at their base, 1½–2 times the sepals. *Styles* very short. *Capsule* ovate-oblong. *Seeds* angular, testa smooth somewhat plaited.

14. **S. corymbosa,** *H. f. & T. in Journ. Linn. Soc.* ii. 70; flowers corymbose rarely 3–1, leaves shining generally glabrous, radical leaves long-petioled lanceolate not large, peduncles glandular upwards not villous. *Engler Monog. Saxifrag.* 126. S. parnassifolia, *Wall. Cat.* 451, *partly.*

SIKKIM and EASTERN NIPAL, alt. 11,000–14,000 ft.; Lachoong, &c., Wallanchoon, *J. D. H., C. B. Clarke.*

Stems 3–8 in. high, much less stout than those of *S. diversifolia.* Stem-*leaves* ½–1 in., oblong or ovate, sometimes sessile and stem-clasping, sometimes narrowed suddenly just above the base. *Petals* obovate, twice the sepals. *Styles* short. *Capsule* ovate; sepals at length deflexed. *Seeds* ellipsoid, subtrigonous, smooth.

This differs from *S. diversifolia* in being much smaller with smaller leaves and flowers. The starved 1–3-flowered examples of *S. corymbosa* may be distinguished from the Indian *S. Hirculus* by the peduncles being glandular but scarcely brown-villose.

SECT. III. **Boraphila** (as to the Indian species). *Sepals* more or less united, patent or reflexed in fruit. *Petals* white. *Leaves* undivided, dentate or crenate.

15. **S. strigosa,** *Wall. in Sternb. Saxifrag. Suppl.* t. 22; whole plant strigose, leaves near the base of the stem falsely rosulate, upper leaves small alternate sessile deflexed, calyx in fruit patent nearly free. *Wall. Cat.* 448; *H. f. & T. in. Journ. Linn. Soc.* ii. 64; *Engler Monog. Saxifrag.* 136.

Central and Western Himalaya; NIPAL; Gossain Than, *Wallich*; SIKKIM, alt. 9000–14,000 ft.; Lachen, Lachoong, *J. D. H.*; Singalelah, *C. B. Clarke.* BHOTAN, *Griffith.*

Stem 4–8 in. high, somewhat rigid, paniculate upwards; upper axils generally producing hispid bulbils, so that the flowers are only 1–3. Lower subrosulate *leaves*

1–2 in., sessile, oblong-lanceolate, with one or two acute teeth. *Petals* small, exceeding the sepals. *Styles* short. *Capsule* less than ¼ in. long. *Seeds* minute, smooth, elliptic, angular.

16. **S. pallida,** *Wall. in Sternb. Saxifrag. Suppl.* t. 23; scape 2–6 in. leafless with narrow bracts at the divisions of the corymb or simple, calyx in fruit adnate to base of ovary for one-third its length, lobes finally recurved, petals twice sepals, capsule ⅓–⅔ in. long. *Wall. Cat.* 450; *DC. Prodr.* iv. 38; *H. f. & T. in Journ. Linn. Soc.* ii. 65; *Engler Monog. Saxifrag.* 140.

Alpine Himalaya; SIKKIM, alt. 13,000–17,000 ft.; Lachen, Kankala, &c., *J. D. H.* NIPAL; Gossain Than, *Wallich.* KUMAON, alt. 14,500 ft.; Barji Kang Pass, *Strachey & Winterbottom.*

Slightly pubescent, sometimes glabrous. Radical *leaves* long-petioled, ovate, dentate-crenate. *Flowers* and fruit very variable in size, sometimes not larger than in the next species. *Style* hardly any. *Seeds* ellipsoid, longitudinally striated by 10–12 rows of tubercles.

17. **S. micrantha,** *Edgw. in Trans. Linn. Soc.* xx. 50; scape 4–8 in. high leafless (rarely 1-leaved) with leaflike bracts at the lower divisions of the corymb, calyx in fruit shortly adnate to base of ovary, lobes finally recurved, petals hardly exceeding sepals, capsule seldom more than ⅓ in. long. *H. f. & T. in Journ. Linn. Soc.* ii. 64; *Engler Monog. Saxifrag.* 141.

Alpine Eastern and Western HIMALAYA, alt. 9000–11,000 ft.; *Edgeworth*; Dhurmsala, *C. B. Clarke*; Gurwhal, *Falconer.* SIKKIM, alt. 10,000–14,000 ft.; Lachen, Tungu, *J. D. H.*

Pubescent. Radical *leaves* long-petioled, ovate, dentate-crenate. *Style* exceedingly short. *Seeds* ellipsoid, longitudinally striated by 10–12 rows of tubercles.—This species will perhaps be merged in the preceding when more material accumulates.

SECT. IV. **Microphylla.** *Flowers* solitary, yellow or white, on leafless peduncles, ⅛–2 in. high.—*Tufts* dense formed by the stems 1–3 in. long, branching and crowded, covered upwards with densely whorled undivided small obtuse leaves about ¼ in. long.

18. **S. imbricata,** *Royle Ill.* 226, t. 49; uppermost leaves with a perforated whitened pit at their apex, flowers sessile, sepals ovate obtuse glabrous or slightly ciliate pubescent. *H. f. & T. in Journ. Linn. Soc.* ii. 62; *Engler Monogr. Saxifrag.* 264.

ALPINE HIMALAYA, from SIKKIM to KASHMIR, alt 12,000–17,000 ft., *Royle, Jacquemont, J. D. H.*, &c.

Leaves ⅛–¼ in., obovate-elliptic, glabrous or a little ciliate, hardly glandular. *Petals* narrow, twice the sepals, deciduous; white (C. B. Clarke noted in the field, also Jacquemont and Jaeschke); yellow in the figure of Royle. *Fruit* less than ¼ in. long.—All the examples now referred surely to *S. imbricata* at Kew exhibit *some* perforated leaves; var. γ. and δ. of H. f. & T. (*in Journ. Linn. Soc.* ii. 62) must be referred elsewhere.

19. **S. hemisphærica,** *H. f. & T. in Journ. Linn. Soc.* ii. 62; uppermost leaves with a broad scariose laciniated margin, flowers subsessile, sepals ovate obtuse erect in fruit slightly pubescent. *Engler Monog. Saxifrag.* 212.

SIKKIM, alt. 17,000–18,000 ft., Mt. Donkiah, *J. D. H.*

Lower *leaves* ¼ in., oblong, entire, glabrescent, upper shorter, ciliate. *Petals* 0 in the fruiting specimens alone collected by Sir J. D. Hooker, probably deciduous as in *S. imbricata*. *Fruit* less than ¼ in. long.

20. **S. perpusilla,** *H. f. & T. in Journ. Linn. Soc.* ii. 72; flowers yellow on glandular peduncles $\frac{1}{4}$–$\frac{3}{4}$ in. high, uppermost leaves about $\frac{1}{8}$ in. obovate-oblong concave white ciliate on edges otherwise glabrous, sepals ciliolate erect in fruit. *Engler Monog. Saxifrag.* 210.

SIKKIM, alt. 16,000–17,000 ft.; Mt. Donkiah, *J. D. H.*

Stems scarcely an inch long. *Petals* golden, twice the sepals, oblong, persistent. *Styles* very short. *Fruit* ovate, subquadrate, shorter than the petals.—The tufts are small, the leaves and sepals very small.

21. **S. microphylla,** *Royle in Herb. Bth. ex H. f. & T. in Journ. Linn. Soc.* ii. 72; peduncles puberulous about $\frac{1}{4}$ in., leaves oblong glabrous, sepals much adnate below erect in fruit, petals 0 or oblong coriaceous equal to the sepals (green-white?). *Engler Monog. Saxifrag.* 210.

WESTERN HIMALAYA, *Royle.* KUMAON, alt. 14,700 ft.; Barji Kang Pass, *Strachey and Winterbottom.*

Still smaller than *S. perpusilla,* with inconspicuous flowers. *Ripe carpels* acuminated upwards, sometimes united conically to the top.

22. **S. Jacquemontiana,** *Dcne. in Jacq. Voy. Bot.* t. 78; flowers golden subsessile or on a glandular peduncle $\frac{1}{2}$ in. long, uppermost leaves obovate-oblong, sepals broad-elliptic glandular-pubescent patent or finally deflexed. *H. f. & T. in Journ. Linn. Soc.* ii. 71; *Engler Monog. Saxifrag.* 211.

Alpine Himalaya, from SIKKIM to KASHMIR, alt. 13,000–18,000 ft.; *Jacquemont, Edgeworth, J. D. H.,* &c.

Lower *leaves* $\frac{1}{8}$–$\frac{1}{4}$ in., orbicular or elliptic, glabrescent; upper glandular-pubescent or nearly glabrous. *Petals* $\frac{1}{4}$ in. long, nearly twice the sepals, elliptic, persistent. *Fruit* ovate, shorter than the petals. *Seeds* minute, ellipsoidal, smooth, testa reticulated not tuberculate.

VAR. 2. β. *Stella-aurea*; (*sp.*) *H. f. & T. in Journ. Linn. Soc.* ii. 72; peduncles $\frac{1}{4}$-2 in.—from Sikkim to Kashmir, alt. 13,500–17,000 ft.; *J. D. H.*

SECT. V. *Flowers* yellow, on sparsely leafy peduncles 1–3 in. from tufts formed by weak stems clothed upwards with subrosulate undivided spathulate-oblong small leaves $\frac{1}{4}$–$\frac{1}{2}$ in. long.

23. **S. ramulosa,** *Wall. in Sternb. Saxifrag. Suppl.* t. 26; peduncles glandular-pubescent 1–2-flowered, upper rosulate leaves glabrous rigid oblong often with 1–5 pits on their front margin, sepals glandular-pubescent in fruit much adnate, lobes triangular suberect. *Wall. Cat.* 446; *DC. Prodr.* iv. 21; *Royle Ill.* t. 49 (*bad*); *H. f. & T. in Journ. Linn. Soc.* ii. 62; *Engler Monog. Saxifrag.* 268. S. glandulifera, *Jacquem. Journ.*

Central and Western HIMALAYA, from NIPAL to KASHMIR, alt. 8500–12,000 ft.; *Wallich, Jacquemont, Strachey & Winterbottom,* &c.

Stems 2–6 in. long, branches crowded into tufts; branches barren or producing a flower-stem, terminated by rosulate crowded leaves. Rosulate *leaves* spathulate-oblong, sometimes very small, sometimes $\frac{1}{2}$ in., margins cartilaginous; leaves on the peduncle linear-spathulate or narrow-oblong. *Petals* obovate, clawed, much exceeding the sepals. *Carpels* in fruit narrowed upwards.—A species by the texture and perforations of its leaves allied to *S. imbricata*; which differs by its sessile flowers and its less glandular-pubescent sepals.

24. **S. umbellulata,** *H. f. & T. in Journ. Linn. Soc.* ii. 71; flower-stems 2–3$\frac{1}{2}$ in., peduncles 1–5 umbelled very glandular, rosulate leaves narrowly spathulate glabrous or slightly ciliate-pubescent. *Engler Monog. Saxifrag.* 222.

Sikkim, alt. 12,000–14,000 ft.; Tungu, *J. D. H.*

Rosulate *leaves* ½ in., cauline ¼ in. long, narrow oblong, very glandular-pubescent. *Peduncles* ¼–1½ in. *Petals* nearly double the sepals, golden.

Sect. VI. **Spinulosæ.** *Flowers* yellow, peduncled, solitary or few. *Stems* elongate, 2–8 in. long, uniformly leafy; i.e. no whorled leaves either at the base or summit. *Leaves* $\frac{1}{4}$–$\frac{3}{4}$ in. long, acute, rigid, often spinulose.

25. **S. brachypoda,** *Don in Trans. Linn. Soc.* xiii. 378; stem simple 1-flowered glabrous below often bearing bulbils in the upper axils, peduncle glandular-scabrous rarely glabrate, leaves linear-lanceolate shining half stem-clasping glabrous or shortly spinulose on the margin. *Don Prodr.* 209; *Sternb. Saxifrag. Suppl. t.* 24; *DC. Prodr.* iv. 46; *H. f. & T. in Journ. Linn. Soc.* ii. 66; *Engler Monog. Saxifrag.* 218. S. glandulosa, *Wall. Cat.* 442; *DC. Prodr.* iv. 45.

Alpine Himalaya, from Bhotan to Kumaon, alt. 9000–13,000 ft., common.

Leaves about ⅜ in., densely imbricate, ascending or reflexed. *Sepals* ovate, acute, little pubescent, suberect in fruit. *Petals* broad, golden, much exceeding the sepals. *Styles* not much shorter than the ripe carpels. *Seeds* ellipsoid, subtrigonous, smooth.

26. **S. fimbriata,** *Wall. in DC. Prodr.* iv. 45; stem simple 1- rarely 2-3-flowered glabrous or sparsely ciliate below often bearing bulbils in the upper axils, peduncle glandular-scabrous, leaves lanceolate shining cordate at base but not stem-clasping, margins prominently spinulose. *Wall. Cat.* 443; *H. f. & T. in Journ. Linn. Soc.* ii. 67; *Engler Monog. Saxifrag.* 218. S. Wallichiana, *Sternb. Saxifrag. Suppl.* t. 22.

Alpine Himalaya, from Sikkim to Kumaon, alt. 11,000–14,000 ft.; *Wallich, J. D. H., Strachey & Winterbottom.*

Leaves about ⅜ in., densely imbricate, ascending or reflexed. *Sepals* ovate, obtuse, very glandular-pubescent, suberect in fruit. *Petals* broad, golden, much exceeding the sepals. *Styles* not much shorter than the carpels in fruit.—This hardly differs from *S. brachypoda.*

27. **S. filicaulis,** *Wall. in Sternb. Saxifrag. Suppl.* t. 23; stems glandular-pilose much branched, branches 1-flowered, leaves $\frac{1}{4}$–$\frac{3}{4}$ in. linear-oblong minutely denticulate. *Wall. Cat.* 445; *DC. Prodr.* iv. 46; *H. f. & T. in Journ. Linn. Soc.* ii. 66; *Engler Monog. Saxifrag.* 221.

Alpine Western Himalaya, Gurwhal and Kumaon, alt. 10,000–11,500 ft.; *Wallich, Falconer, Edgeworth, T. Thomson,* &c.

Bulbiferous sometimes in the upper axils. *Sepals* small, ovate, glandular-pilose, erect in fruit. *Petals* golden, more than twice the sepals. *Styles* in fruit little shorter than the carpels.

28. **S. hispidula,** *Don in Trans. Linn. Soc.* xiii. 380; stems hispid glandular simple 1–3-flowered, leaves $\frac{1}{4}$–½ in. long oblong-lanceolate acute entire or often 1–3-toothed hispid on both surfaces. *Don Prodr.* 210; *DC. Prodr.* iv. 46; *H. f. & T. in Journ. Linn. Soc.* ii. 67; *Engler Monog. Saxifrag.* 222. S. evolvuloides, *Wall. Cat.* 447; *DC. Prodr.* iv. 46; *Sternb. Saxifrag. Suppl.* t. 23.

Alpine Himalaya, from Bhotan to Nipal, alt. 13–15,000 ft. Nipal, Gossain Than, *Wallich*; Bhotan, *Griffith*; Sikkim, Kankola, *J. D. H.*, Jongri, *C. B. Clarke.*

Rarely bulbiferous in the upper axils. *Sepals* narrow, ovate, hispid-glandular, erect in fruit. *Petals* golden, obovate, near twice the sepals. *Styles* short. *Seeds* ellipsoid, subtrigonous, smooth.

SECT. VII. **Flagellares.** *Flowers* yellow, on leafy stems 2–8 in high rising from a basal tuft of rosulate leaves; from this tuft spread horizontally leafless thread-like surculi which terminate in rooting buds. Stem *leaves* entire, narrow.

29. **S. Brunoniana,** *Wall. in Sternb. Saxifrag. Suppl.* t. 23; stems corymbosely 1–10-flowered, pedicels long often 1–2 in., leaves linear acute shining, margins spinulose. *Engler Monog. Saxifrag.* 223. S. Brunonis, *Wall. Cat.* 444; *DC. Prodr.* iv. 45; *H. f. & T. in Journ. Linn. Soc.* ii. 66.

Temperate Himalaya, from SIKKIM to KASHMIR, alt. 16,000 ft.; *Wallich, Jacquemont, T. Thomson, J. D. H.,* &c.

Glabrous; 2–8 in. high. Rosulate *leaves* $\frac{1}{4}$–$\frac{3}{4}$ in.; cauline usually small. *Sepals* elliptic-oblong, small, patent in fruit. *Petals* 3 or 4 times the length of the sepals, oblong-elliptic. *Styles* short. *Seed* ellipsoid, smooth, most minutely papillose.

30. **S. pilifera,** *H. f. & T. in Journ. Linn. Soc.* ii. 66; stems corymbosely 1-4-flowered, pedicels short about $\frac{1}{4}$ in., leaves hardly $\frac{1}{8}$ in. spathulate-linear or oblong, margins not spinulose, petals equalling the sepals. *Engler Monog. Saxifrag.* 223.

SIKKIM, alt. 14–15,000 ft., *J. D. H.*

Stems 1–3 in. high, pubescent. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ in., cauline pubescent, rosulate, nearly glabrous. *Sepals* much adnate in fruit into a campanulate tube; lobes obtuse, erect. *Styles* short. *Ripe carpels* very small.

31. **S. flagellaris,** *Willd. in Sternb. Saxifrag.* t. 6; stems 2–8 in high corymbosely 1–10-flowered, pedicels 0–2 in., cauline leaves linear-lanceolate pubescent ciliate or subspinulose, petals golden much exceeding the sepals sometimes $\frac{1}{2}$ in. long. *Don in Trans. Linn. Soc.* xiii. 373; *DC. Prodr.* iv. 45; *Ledeb. Ic. Fl. Ross.* t. 321; *H. f. & T. in Journ. Linn. Soc.* ii. 65; *Boiss. Fl. Orient.* ii. 809; *Engler Monog. Saxifrag.* 223. S. myosotifolia, *Pall. ex Don in Trans. Linn. Soc.* xiii. 373; *DC. Prodr.* iv. 45. S. stenophylla, *Royle Ill.* t. 50; *H. f. & T. in Journ. Linn. Soc.* ii. 65. S. Hoffmeisteri, *Klotzsch in Reis. Pr. Waldem. Bot.* t. 41. S. aurea *and* S. radicans, *Jacq. Voy. Bot.*; with some others; but S. aspera, *Willd.,* sometimes quoted here, does not belong.

Alpine Himalaya, from KASHMIR and KUMAON, alt. 13,500–17,000 ft., common, to SIKKIM, alt. 18,000 ft., Lama Kongra, *J. D. H.*—DISTRIB. North Asia, Arctic regions and Rocky Mountains.

Stems pubescent upwards. *Sepals* oblong, pubescent, slightly adnate and erect in fruit. *Petals* often with red lines (not dots) near the base. *Styles* short. *Seeds* ellipsoid, smooth, testa reticulate and microscopically punctulate.—This species is called polymorphic, but without very good reason, the following three varieties being distinguished by trivial characters only, and running into each other. The Rocky Mountain var. *setigera* (sp. of Pursh) is more remote by the calyx much adnate to the fruit.

VAR. 1. *typica*; leaves pubescent, margins a little ciliate.

VAR. 2. *mucronulata* (Royle sp.); leaf margins more ciliate or glistening and subspinulose.

VAR. 3. *stenophylla* (Royle sp.); lower leaves and stem less pubescent or nearly glabrous.

SECT. VIII. **Porphyrion.** *Leaves* sub-opposite, small, often with a pore at the apex. *Flowers* solitary, red or purple.

32. **S. oppositifolia,** *Linn.*; *DC. Prodr.* iv. 17; rosulate leaves $\frac{1}{4}$–$\frac{1}{8}$ in. obovate glabrous or the upper ciliolate, no disc surrounding the carpels. *Engl.*

Bot. t. 9; *Don in Trans. Linn. Soc.* xiii. 400; *H. f. & T. in Journ. Linn. Soc.* ii. 62; *Engler Monog. Saxifrag.* 276.

WESTERN TIBET, alt. 15–17,000 ft.; Sassar, *T. Thomson.*—DISTRIB. Alps of Europe and Asia, Arctic Regions.

Stems 1–2 in. long, much branched and crowded, forming dense tufts. *Leaves* densely crowded, *Flowering* stems from the ends of the branches, ½–2 in. long, with decussate opposite (or altogether alternate) leaves. *Sepals* ovate-oblong, nearly glabrous, erect in fruit, adnate to the ovary at the base. *Petals* ⅜ in. long, obovate-oblong, twice the sepals. *Seeds* ellipsoid, rugulose, minutely papillose.—In Dr. Thomson's specimens some flowers have 3 carpels.

SECT. IX. **Bergenia.** *Rootstock* stout. *Leaves* ample, undivided, with a large sheath at the base of the petiole. *Scape* corymbose, 6–18 in. high. *Petals* white or red. *Calyx*-lobes erect in fruit. *Seeds* much larger than in other sections, elongate, subpyramidal, smooth.

33. **S. ligulata,** *Wall. in Asiat. Research.* xiii. 398, *with a figure*; leaves orbicular or obovate quite entire ciliate, base cordate, pedicels and calyx glabrous, calyx-teeth ovate not narrowed at base, fruit-pedicels cernuous. *Wall. Cat.* 449; *Don in Trans. Linn. Soc.* xiii. 348; *Hook. Exot. Flora,* i. t. 49 (*excellent*); *Hook. Bot. Mag.* t. 3406 (the sepals too acute, and the leaves too undulate); *DC. Prodr.* iv. 38; *H. f. & T. in Journ. Linn. Soc.* ii. 60.

Temperate HIMALAYA, from BHOTAN to KASHMIR, alt. 7–10,000 ft., common. Khasia Mts., alt. 4000 ft.

Leaves a foot in diam. in Khasia; smaller in Bhotan until 2 in. diam. in Kumaon; glabrous on both surfaces, dotted on the lower. *Petals* ⅓–1 in. long, white or rose or purplish, orbicular with a claw of variable length. *Fruit* subglobose. *Styles* very long. *Carpels* sometimes 3.

VAR. 2. *ciliata*; *Royle Ill.* t. 49 (*sp.*); *Hook. Bot. Mag.* t. 4915; *H. f. & T. in Journ. Linn. Soc.* ii. 60; leaves hirsute on both surfaces.—Nipal and Kumaon, alt. 6–8000 ft.; *Royle, T. Thomson, Edgeworth, Strachey and Winterbottom.*

34. **S. Stracheyi,** *H. f. & T. in Journ. Linn. Soc.* ii. 61; leaves obovate scarcely cordate at base, pedicels and calyx pubescent or puberulous, calyx-teeth oblong, often wider above their base, fruit-pedicels generally erect. ? S. ligulata, var. γ., *H. f. & T. in Journ. Linn. Soc.* ii. 61; *Lindl. in Bot. Reg.* 1843, t. 65.

KUMAON and KASHMIR, alt. 8000–14,000 ft., common.

Leaves glabrous on both surfaces margin either subentire ciliate, or crenate-serrate. *Petals* white or rose, or (according to a field note of Dr. Thomson's) yellow. *Fruit* ovate-lanceolate. *Styles* long.

35. **S. purpurascens,** *H. f. & T. in Journ. Linn. Soc.* ii. 61; leaves glabrous obovate entire, margins undulate, pedicels very pubescent, flowers nodding, calyx-lobes very obtuse. *Hook. Bot. Mag.* t. 5066.

SIKKIM, alt. 10–15,000 ft.; Lachen, *J. D. H.*; Yakla Pass, *C. B. Clarke.*

Leaves 2–3 in. diam., punctate beneath. *Petals* ¾ in. long, obovate-oblong. *Styles* long. *Carpels* elliptic-lanceolate. *Fruit* erect.

DOUBTFUL SPECIES.

SAXIFRAGA from Karnag in Tibet, stated to be near *S. diapensoides* by Kurz (Flora, 1872, 286) is quite unknown to me. It is not described.

3. **VAHLIA,** *Thunb.*

Annual or biennial herbs. *Leaves* opposite, entire; stipules 0. *Flowers* axillary, usually geminate, subsessile or pedicelled. *Calyx-tube* entirely adherent to the ovary; lobes 5, valvate, persistent in fruit. *Petals* 5, epigynous. *Stamens* 5, epigynous. *Ovary* inferior, 1-celled, with 2 pendulous many-ovuled placentas; styles 2, stigma capitellate. *Capsule* dehiscing at the apex between the styles. *Seeds* numerous, minute, ellipsoid, smooth.—DISTRIB. Species 3; in tropical and subtropical Asia, and in tropical and South Africa.

1. **V. viscosa,** *Roxb. Fl. Ind.* ii. 89; flowers subsessile geminate or solitary in nearly all the upper axils, filaments with a minute hairy scale at the base. *W. & A. Prodr.* 364; *Wight Ic.* t. 563; *H. f. & T. in Journ. Linn. Soc.* ii. 74; *Dalz. & Gibs. Bomb. Fl.* 90; *Oliv. Fl. Trop. Afr.* ii. 383. V. sessiliflora, *Wall. Cat.* 7188; *DC. Prodr.* iv. 54. V. Weldenii, *Reich. Hort. Bot.* t. 91; *DC. Prodr.* iv. 53. Bistella geminiflora, *Delile Centurie Pl. d'Afriq.* No. 91, *with a figure.* Oldenlandia digyna, *Retz Obs.* iv. 23.

Dry places of INDIA, from CEYLON to BUNDELKUND and the PUNJAB, frequent.—DISTRIB. Persia, Egypt, tropical Africa.

Glandular-pubescent. *Stem* 6–12 in. high, erect or diffuse, branched. *Leaves* $\frac{1}{2}$–1 in. long, subsessile, oblong, narrowed at both ends, ovate or lanceolate. *Petals* about $\frac{1}{8}$ in. long, white (ex Roxb. yellow), obovate. *Stamens* and *styles* about $\frac{1}{8}$ in. long in the Indian specimens, these parts much larger and the filaments pubescent in the African var. *Weldenii*. *Capsule* about $\frac{1}{8}$ in. diam., subglobose.—This and the succeeding species when in fruit must be carefully distinguished from *Oldenlandia* which has the capsule completely 2-celled. The leaves of *Vahlia* have often a connecting line as if falsely stipulate. *Mitreola* which differs by its single style is also mixed with *Vahlia* in Herbaria.

2. **V. oldenlandioides,** *Roxb. Fl. Ind.* ii. 89; peduncles $\frac{1}{8}$–$\frac{1}{4}$ in. long from nearly all the upper axils mostly 2-flowered, filaments naked at the base. *W. & A. Prodr.* 364; *Wight Ill.* t. 115; *Ic.* t. 562; *H. f. & T. in Journ. Linn. Soc.* ii. 74; *Oliv. Fl. Trop. Afr.* ii. 384. V. Oldenlandiæ, *DC. Prodr.* iv. 54; *Wall. Cat.* 7187. V. silenoides, *DC. Prodr.* iv. 54.

Tropical dry portion of the Western Peninsula and CEYLON; *Shuter, Perottet, Roxburgh, Wight,* &c.—DISTRIB. Tropical Africa.

Glandular-pubescent upwards. *Stem* 3–12 in. high, erect or diffuse, branched. *Leaves* $\frac{1}{2}$–2 in. long, subsessile, linear or linear-ovate. *Calyx-lobes* not exceeding the tube. *Petals* about $\frac{1}{6}$ in. long, white, obovate. *Capsule* about $\frac{1}{8}$ in. diam., subglobose.

4. **TIARELLA,** *Linn.*

Slender erect herbs; root perennial. *Leaves* alternate; radical long-petioled with large stipules adnate to base of petiole; stipules of upper leaves small. *Raceme* terminal, subebracteate. *Calyx* shortly adnate to the ovary; lobes 5, valvate. *Petals* 5, white, or 0. *Stamens* 10, the 5 alternate with sepals sometimes without anthers. *Ovary* 1-celled of 2 carpels ending in two styles; ovules numerous, attached to two nearly basal placentas. *Ripe carpels* very unequal, diverging at top, and dehiscing ventrally. *Seeds* 6–16, near the base of the fruit, ellipsoid, smooth.—DISTRIB. Species 5, one Himalayan and Japanese; the other 4 North American.

1. **T. polyphylla,** *Don Prodr.* 210; stem-leaves several all petioled cordate-ovate subpentagonal crenate-serrate, petals small linear or 0, fruit cernuous

glabrous. *Wall. Cat.* 437; *DC. Prodr.* iv. 50; *H. f. & T. in Journ. Linn. Soc.* ii. 74.

Temperate Central and Eastern Himalaya; from BHOTAN to NIPAL, alt. 8–11,000 ft.; *Wallich, Griffith, J. D. H.*, &c.—DISTRIB. Japan.

Stem 6–18 in. high, pubescent. *Leaves* pilose on both surfaces, lower long-petioled, blade 1–3 in. diam. *Sepals* $\frac{1}{8}$ in. long, whitish, glandular. *Petals* when present shorter than the sepals. *Ripe carpels* one $\frac{1}{4}$ in. long, the other $\frac{1}{3}$ in.

5. **CHRYSOSPLENIUM,** *Linn.*

Weak, succulent herbs, growing in damp or watery places. *Leaves* undivided, petioled; stipules 0. *Flowers* axillary and terminal, short-pedicelled, small, green or yellow, 4-merous in the Indian species, rarely 5-merous. *Calyx-tube* adnate to the ovary; lobes 4, imbricate. *Petals* 0. *Stamens* 8 (or 4), subepigynous. *Ovary* 1-celled, 2-lobed above; styles short; ovules numerous, attached to parietal placentæ alternating with the stigmas. *Capsule* half-superior, dehiscing at top crosswise. *Seeds* small, ellipsoid.—DISTRIB. Species 22; North Europe, Asia (South to the Himalaya) and A nerica; in the Andes to Magellan's Straits.

* *Leaves opposite.*

1. **C. nepalense,** *Don Prodr.* 210; glabrous, branched, or in water tufted, leaves ovate or subcordate obtuse crenate, flowers subsessile, seeds smooth shining chestnut-brown. *Wall. Cat.* 438; *DC. Prodr.* iv. 48; *H. f. & T. in Journ. Linn. Soc.* ii. 72; *Maxim. in Bull. Acad. Petersb. Mel. Biol.* ix. 766.

Temperate Himalaya; from BHOTAN to KUMAON, alt. 7000–10,000 ft., frequent.

A decumbent, weak species, with branches 6–8 in. long, closely resembling *C. oppositifolium*, L., which only differs in having its leaves entire or obsoletely crenate.

Maximowicz (*in Bull. Acad. Petersb. Mel. Biol.* ix. 767) has founded a new Himalayan species *C. sulcatum, Maxim* on *Wall. Cat.* 438; which differs from *C. nepalense* in having the seeds profoundly 12-sulcate; but the examples of Wall. Cat. 438 at Kew exhibit the smooth seeds of *C. nepalense.*

2. **C. trichospermum,** *Edgw. MSS.*; *H. f. & T. in Journ. Linn. Soc.* ii. 73; glabrous, branched, leaves ovate or elliptic obtuse crenate, flowers shortly pedicelled, seeds globose shining chestnut-brown covered with golden 1-celled linear papillæ. *Maxim. in Bull. Acad. Petersb. Mel. Biol.* ix. 767.

Temperate Western HIMALAYA, alt. 7–8000 ft.; *Edgeworth, Madden*; Dwali, alt. 8000 ft., in KUMAON, *Strach. & Winterbottom.*

A rather stouter plant than *C. nepalense,* the leaves $\frac{1}{2}$–$\frac{3}{4}$ in. diam.

** *Leaves alternate; plant glabrous.*

3. **C. alternifolium,** *Linn.*; *DC. Prodr.* iv. 48; stem weak succulent suberect 2–8 in. long, leafless (or 1-leaved) except at the base and the summit, radical leaves long-petioled suborbicular crenate-lobed, flowers subsessile. *Engl. Bot.* t. 54; *H. f. & T. in Journ. Linn. Soc.* ii. 73; *Boiss. Fl. Orient.* ii. 813; *Maxim. in Bull. Acad. Petersb. Mel. Biol.* ix. 760.

SIKKIM, alt. 12,000–15,000 ft.; Kankola, *J. D. H.*—DISTRIB. Alpine and Arctic Europe, Asia and N. America.

Leaves $\frac{1}{4}$–$\frac{3}{4}$ in. diam., oval or cordate, rounded at the top, floral leaves golden yellow. *Seeds* shining, smooth.

4. **C. carnosum,** *H. f. & T. in Journ. Linn. Soc.* ii. 73; tufted, stems 2–4 in. high erect thick leafy, radical leaves represented by short sheathing

scales, flowers sessile. C. carnosulum, *Maxim. in Bull. Acad. Peters., Mel. Biol.* ix. 757.

SIKKIM HIMALAYA, alt. 14–15,000 ft., Yeumtong and Kankola 'near the perpetual snow,' *J. D. H.*

Leaves about ¼ in. diam., glossy, very deep green, elliptic, obtuse, crenate-dentate. *Flowers* lurid. *Calyx* segments purple.—This may prove only an extreme form of *C. alternifolium.*

5. **C. Griffithii,** *H. f. & T. in Journ. Linn. Soc.* ii. 74; stems 4–6 in. high suberect, leafy at the summit, radical leaves represented by short sheathing scales, leaves reniform-cordate deeply crenate-lobate, flowers pedicelled. *Maxim. in Bull. Acad. Petersb., Mel. Biol.* ix. 759.

BHOTAN; *Griffith.*

Leaves ½–1 in. broad; lobes 6–16, very obtuse, often ¼ in. deep.—Very near *C. nudicaule*, Bunge.

6. **C. tenellum,** *H. f. & T. in Journ. Linn. Soc.* ii. 73; stems filiform procumbent interlacing leafy, leaves reniform cordate crenate-lobate, flowers scattered pedicelled, seeds smooth shining. *Maxim. in Bull. Acad. Petersb., Mel. Biol.* ix. 762.

Temperate Western HIMALAYA; Kedarkanta in GURWHAL, *Royle*; Madhari Pass, in KUMAON, alt. 10,000 ft., *Strachey & Winterbottom.*

Stems 1–3 in. long. *Leaves* ⅜ in. broad, with 4–8 shallow lobes; radical long-petioled.

*** *Leaves alternate; plant pubescent.*

7. **C. lanuginosum,** *H. f. & T. in Journ. Linn. Soc.* ii. 74; stem 3–8 in. high erect leafy, corymb loose terminal sparingly leafy, leaves 1–2 in. long elliptic slightly crenate. C. adoxoides, *Maxim. in Bull. Acad. Petersb., Mel. Biol.* ix. 760. Saxifraga adoxioides, *Griff. Ic. Pl. Asiat.* t. 570.

Eastern Himalaya; BHOTAN, alt. 7500–8000 ft., *Griffith.* SIKKIM, alt. 7–9000 ft., *T. Anderson, C. B. Clarke.*

Whole plant pubescent and with brown-red wool. *Corymb*, when well developed, 2–3 in. across, with leaf-like bracts at a few of the divisions.—Sometimes stunted and more compact.

6. PARNASSIA, *Linn.*

Glabrous perennial scapigerous herbs. *Scape* angular, 1-flowered, often bearing one leaf in the middle, more rarely naked or with several leaves. *Leaves* entire, radical long-petioled. *Calyx*-tube free or adnate to the ovary, the lobes 5, imbricate. *Petals* 5, white or pale yellow. *Stamens* 5, perigynous or nearly hypogynous, alternate with 5 large staminodes. *Ovary* 1-celled; style short with 3–4 (or 5) nearly simple stigmas; ovules numerous attached to the parietal placentæ opposite the stigmas. *Capsule* superior or half-inferior, loculicidally 3–4-valved. *Seeds* many, obovoid or subcylindric, smooth, testa sometimes lax; albumen hardly any; (in which point *Parnassia* differs from the character of the order *Saxifragaceæ* and is therefore placed by some authors elsewhere).—DISTRIB. Northern temperate hemisphere, extending south to the mountains of the Indian Peninsula. Species 12.

SECT. I. **Nectarodroson.** *Staminodes* ending in numerous long gland-bearing processes. *Petals* entire.

1. **P. palustris,** *Linn.*; *DC. Prodr.* i. 320; leaves cordate at the base, cauline usually solitary, processes of the staminodes 7–21. *Eng. Bot.* t. 82; *Bois. Fl. Orient.* ii. 814; *Drude in Linnæa,* xxxix. 307.

WESTERN TIBET, *Falconer*; Skardo in BALTISTAN, alt. 7500 ft. *T. Thomson, C. B. Clarke.*—DISTRIB. Subalpine and subarctic regions.

Petals ovate-elliptic with a broad claw. *Stamens* nearly hypogynous. *Carpels* 4. *Capsule* superior or nearly so, oblong-elliptic, much longer than the sepals. *Seeds* cylindric; testa loosely reticulate.

SECT. II. **Fimbripetalum.** *Staminodes* ending in several long gland-bearing processes. *Petals* fimbriate.

2. **P. foliosa,** *H. f. & T. in Journ. Linn. Soc.* ii. 79; stem with 4–8 leaves, staminodes ending in 3 long processes each tipped with a distinctly clubbed gland. P. foliosa *and* P. Nummularia, *Drude in Linnæa,* xxxix. 313.

KHASIA MTS., alt. 5000–6000 ft., Moflong to Syung and at Nonkrem, *J. D. H.* and *T. Thomson.*—DISTRIB. West China and Japan.

Stem 8–12 in. high. Radical *leaves* orbicular, deeply cordate. *Sepals* patent or reflexed. *Petals* ovate above a short claw, fimbriated around their whole edge. *Carpels* 4. *Capsule* superior or nearly so, long-ellipsoid, much longer than the sepals.

Drude states he had no specimen of *P. foliosa.* Kew possesses both *P. foliolosa* collected by H. f. & T., and *P. Nummularia* collected by Maximowicz; the two are identical.

SECT. III. **Nectarotrilobos.** *Staminodes* at the vertex 3- (rarely 5-) lobed, the lobes short or cylindric, not linear. *Stem* 1- (or 0-) leaved.

* *Capsule triquetrous, superior or nearly so.*

3. **P. Wightiana,** *Wall. in W. & A. Prodr.* 35; petals obovate-oblong margins much fimbriate, staminodes 3–5-lobed, lobes cylindric (or in the Nilghiri plant) thickened at the top, capsule 3-celled superior, obcordate. *Wall. Cat.* 3755; *Wight. Ill.* t. 21; *Ic.* t. 945; *Arn. in Hook. Comp. Bot. Mag.* ii. 315; *H. f. & T. in Journ. Linn. Soc.* ii. 80; *Drude in Linnæa,* xxxix. 314. P. ornata, *Wall. Cat.* 1247; *Arn. in Hook. Comp. Bot. Mag.* ii. 315. P. Schmidii, *Zenker Pl. Ind.* t. 5.

NILGHIRI MTS., alt. 7000 ft. KHASIA MTS., alt. 4500–6000 ft. 'HIMALAYA,' Wallich. KUMAON, fide *H. f. & T. in Journ. Linn. Soc.* ii. 80.—DISTRIB. Yunan and interior of China.

Stem 8–18 in. high. *Leaves* often $1\frac{1}{4}$ in., reniform or oval, deeply cordate. *Petals* (at least in the Khasia plant) light yellow. *Placentæ* near the base of the capsule. *Seeds* ellipsoid; testa reticulate, not very lax.

4. **P. mysorensis,** *Heyne in W. & A. Prodr.* 35; petals obovate-oblong, margins not or obscurely fimbriate, staminodes 3-lobed, lobes cylindric or dilated upwards, capsule 3-celled superior obcordate. *Wall. Cat.* 3754; *Wight Ill.* t. 21; *Arn. in Hook. Comp. Bot. Mag.* ii. 315; *H. f. & T. in Journ. Linn. Soc.* ii. 80; *Drude in Linnæa,* xxxix. 317.

Eastern Himalaya; SIKKIM, alt. 8000–12,000 ft.; Lachen and Yeumtong, *J. D. H.* Mts. of the Western Peninsula. KHASIA MTS. alt. 3500–5500 ft.

Stem 3–8 in. high. *Leaves* $\frac{1}{2}$–$\frac{3}{4}$ in. diam., reniform, deeply cordate. *Petals* small, white. *Seeds* small, ellipsoid; testa somewhat laxly reticulate.

** *Capsule half-inferior.*

5. **P. nubicola,** *Wall. in Wight Ill.* t. 21; margins of petals not (or slightly) fimbriate, staminodes broadly dilated upwards 3-lobed, capsule $\frac{1}{2}$ in. long obconic below subhemispheric above, style very short or 0. *Wall. Cat.* 1246; *Arn. in Comp. Hook. Bot. Mag.* ii. 315; *H. f. &. T. in Journ. Linn. Soc.* ii. 81; *Drude in Linnæa,* xxxix. 315.

Temperate and Alpine Himalaya from SIKKIM to KASHMIR, alt. 6000–12,000 ft., frequent.

Stem 4–18 in. high, subalate with 4–5 ridges under the fruit. *Leaves* 1–2 (sometimes 3) in., ovate or cordate, oblong. *Petals* ½ in. long, white, obovate. *Carpels* and stigmas 3; (Drude says 4 but they are nearly invariably 3 in the Kew plentiful examples). *Seeds* obovoid-ellipsoid, smooth; testa reticulate, not lax.

6. **P. ovata,** *Ledeb. in Mem. Acad. Petersb.* v. 528; margins of petals not (or slightly) fimbriate, staminodes broadly dilated upwards 3-lobed, capsule ¼–⅜ in. long obconic below subhemispheric above, style manifest $\frac{1}{32}$ in. long. *DC. Prodr.* i. 320; *Ledeb. Ic. Fl. Ross.* t. 242; *Fl. Ross.* i. 263; *H. f. & T. in Journ. Linn. Soc.* ii. 82; *Drude in Linnæa,* xxxix. 320. P. Turczaninovii, *Ledeb. Fl. Ross.* i. 263; *Drude, l. c.* 321. P. affinis, *H. f. & T. l. c.* ii. 81; *Drude, l. c.* 317. P. Laxmanni, *Pall. in Roem. & Sch. Syst.* vi. 696; *Ledeb. Fl. Ross.* i. 264. P. trinervis, *Drude, l. c.* 322.

Temperate and Alpine Himalaya from SIKKIM to KASHMIR, alt. 8000–15,000 ft., frequent.—DISTRIB. Altai Mts.

Stem 3–8 in. high. *Leaves* ½–¾ in., ovate or ovate-oblong, often cordate; cauline usually solitary in the lower half of the stem. *Petals* ½–¾ in. long, spathulate-obovate. *Carpels* 3, rarely 4. Testa of the *seed* close (Drude).—This differs from P *nubicola* by the smaller size of all its parts and the manifest style. *P. cabulica,* Planch in Herb. Griffith, differs by the stems being usually leafless. *P. subacaulis,* Kar. & Kir. differs by the leaves being oblong narrowed at their base; it was collected by Dr. Henderson near Yarkand, and appears in his list No. 136 under the name *P. maisorensis.*

7. **P. pusilla,** *Wall. ex H. f. & T. in Journ. Linn. Soc.* ii. 81; margins of petals slightly fimbriate or quite entire, staminodes with a very short claw hardly longer than broad dilated upwards 3-lobed, capsule ¼ in. long obovoid-ellipsoid adnate about ⅓ its length, style manifest $\frac{1}{32}$ in. long. *Wall. Cat.* 1245; *Arn. in Wight. Ill.* p. 45 *and in Comp. Hook. Bot. Mag.* ii. 315; *Drude in Linnæa,* ix. 318.

ALPINE HIMALAYA from SIKKIM to KUNAWUR, alt. 12–15,000 ft., *Wallich, J. D. H., Munro,* &c.

Stem 1–2½ in. long. *Leaves* ¼–⅜ in., reniform or ovate-cordate; cauline leaf usually one, often in the upper half of the stem. *Petals* ¼–⅜ in. long, obovate. *Carpels* 3. *Seeds* ellipsoid, smooth; testa reticulate not lax.—This species should probably be estimated an alpine var. of *P. ovata,* from which it differs in its stunted size and shorter staminodes.

SECT. IV. **Saxifragastrum.** *Staminodes* cylindric, undivided at the vertex.

8. **P. tenella,** *H. f. & T. in Journ. Linn. Soc.* ii. 80; petals ⅛ in. long green-white reflexed obovate, capsule ⅛ in. long obcordate triquetrous. *Drude in Linnæa,* xxxix. 323.

SIKKIM HIMALAYA; alt. 10,000–12,000 ft.; Lachen and Lachoong, *J. D. H.*

Stem 2–5 in. long, weak. Radical *leaves* ¾ in. broad, reniform, margin minutely erose; petiole with adnate fimbriate stipules at the base; cauline usually 1, cordate-ovate. *Staminodes* thick, cylindric, glandulose, clavate at its summit. *Styles* 3, short, but manifest. *Seeds* (immature) of the genus.

7. HYDRANGEA, *Linn.*

Large shrubs or trees, in their young state often subscandent with smaller leaves. *Corymbs* terminal, with deciduous bracts. *Flowers* all fertile and small, or the exterior flowers of the corymb sterile apetalous with the calyx-lobes peta-

loid and greatly enlarged. *Calyx*-tube adnate to the ovary, limb 4–5-fid. *Petals* 4–5, valvate. *Stamens* 8–10, subepigynous. *Ovary* inferior; styles 2-4; ovules very numerous, axile. *Capsule* 2–4-celled, dehiscing at the apex between the styles. *Seeds* minute, shortly tailed at each end, very numerous.—DISTRIB. Species 33 from Java to the Himalaya and Japan (the centre of the genus), Eastern N. America, Western S. America.

The seeds of *Hydrangea* are described by many authors, as by the accurate Maximowicz, as alate. The seed in its inner coat is a perfectly smooth ellipsoid; the outer coat is a loose long cylindric sack, in the middle of which the nucleus lies; as the seed ripens the empty ends of the sack wither and contract whence results a seed 'tailed at each end.'

* *Fruit truncate at top, petals falling off in a cap, styles very generally not always separate.*

1. **H. altissima,** *Wall. Tent. Fl. Nep.* t. 50; leaves glabrous except tufts of brown hairs in the axils of the main nerves beneath which hairs sometimes are continued along the veins also, stamens 10. *Wall. Cat.* 439; *DC. Prodr.* iv. 14; *H. f. & T. in Journ. Linn. Soc.* ii. 75; *Brand. For. Fl.* 211.

Temperate Himalaya from GURWHAL to BHOTAN, alt. 4000–8000 ft. (10,000 ft. in Sikkim, *J. D. H.*), frequent.

A spreading shrub, 8–15 ft. high, branchlets glabrous. *Leaves* 3–6 in., ovate-lanceolate, sometimes cordate, sometimes narrow-lanceolate; usually finely (sometimes more coarsely) serrate or entire except near the apex; upper petioles often winged and woolly-hairy. *Corymb* pilose. Flower-*buds* conical, acute, but the calyptra-like corolla by the rapid swelling of the stamens becomes hemispheric before falling. *Sepals* of the radiate flowers usually entire; sometimes waved or slightly toothed. *Capsule* subhemispheric, compressed, broader than long.—*H. scandens, Maxim.*, which includes several Japanese species, only differs by having 15 stamens and rather larger buds.

** *Fruit truncate at top, petals expanding.*

2. **H. robusta,** *H. f. & T. in Journ. Linn. Soc.* ii. 76; leaves large ovate or cordate at base adpressedly brown-hirsute on the nerves beneath and minutely tessellated with white hairs along the tesselations but not tomentose, styles normally 2. H. cyanema, *Nutt. in Bot. Mag.* t. 5038.

Temperate Eastern Himalaya; SIKKIM and BHOTAN, alt. 5000–8000 ft., frequent; *Griffith, J. D. H.*, &c.

A spreading shrub, 8–15 ft. high; branchlets hairy or pubescent. *Leaves* up to 9 in., from narrow oblong to broad cordate, the base never acute, serrate (usually coarsely), upper surface with scattered hairs, and adpressedly brown pilose along the nerves; upper petioles often winged, sometimes incise-serrate and subruncinate. *Corymb* hirsute. *Sepals* of the radiate flowers sharply serrate or crenate or undulate. *Petals* and stamens blue. *Styles* not rarely 3. *Capsules* subhemispheric, compressed, broader than long.

VAR. *Griffithii*; upper leaves narrowed into the petiole, with scattered bristly hairs on the nerves beneath smooth not tesselated between them.—Eastern Bhotan, *Griffith.*

3. **H. aspera,** *Don Prodr.* 211; leaves long-lanceolate generally narrowed into the petiole, under surface with grey woolly hair, styles normally 3. *H. f. & T. in Journ. Linn. Soc.* ii. 75. H. vestita var. fimbriata, *Wall. Cat.* 440 β; *DC. Prodr.* iv. 14.

Temperate Himalaya, alt. 6000–7000 ft.; SIKKIM, Lachen, *J. D. H.*; NIPAL, *Wallich*; KUMAON, Upper Tola, *Strachey & Winterbottom.*

Arboreous, sometimes 20 ft. high, branchlets pubescent. *Leaves* 6–8 by 2–3 in.,

upper surface with scattered minute hairs, lower microscopically mealy punctate and densely clothed with long white hairs; petiole of the uppermost leaves not at all or but slightly winged. *Corymb* hirsute. *Sepals* of the radiate flowers usually serrate or toothed, sometimes quite entire. *Styles* not rarely 4, rarely 2. *Capsule* hemispheric, obscurely trigonous or subquadrate.

*** *Capsule crowned with a disc formed by the base of the normally* 3 *styles, petals expanding.*

4. **H. vestita,** *Wall. Tent. Fl. Nep.* t. 49; leaves densely pubescent-tomentose beneath, styles short. *Wall. Cat.* 440 *a.*; *DC. Prodr.* iv. 14, *excluding var. β.*; *H. f. & T. in Journ. Linn. Soc.* ii. 75; *Maxim. in Mem. Acad. Petersb.* x. No. 16. p. 10. H. heteromalla, *Don Prodr.* 211; *DC. Prodr.* iv. 15. H. Khasiana, *H. f. & T. in Journ. Linn. Soc.* ii. 75.

Temperate Himalaya from BHOTAN to KUMAON, alt. 8000–10,000 ft.; frequent. KHASIA MTS., alt. 4500–5500 ft.

Arborescent, 15 ft. high; branchlets hairy. *Leaves* 4–9 in., ovate or oblong, serrate, base sometimes cordate; upper surface with scattered hairs, lower tessellated and densely clothed with white densely papillose hairs. *Corymb* hirsute. *Sepals* of the radiate flowers entire. *Styles* occasionally 4.

5. **H. stylosa,** *H. f. & T. in Journ. Linn. Soc.* ii. 75; leaves glabrous, nerves beneath pubescent, styles long subulate.

SIKKIM HIMALAYA, alt. 8000 ft., Lachen, *J. D. H.*

Branches and branchlets puberulous. *Leaves* 2 in., serrate, elliptic, narrowed at the base. *Corymb* pilose. *Sepals* of the radiate flowers crenate-dentate.

DOUBTFUL SPECIES.

* H. ANOMALA, *Don Prodr.* 211; *DC. Prodr.* iv. 15; leaves sinuate-crenate nearly glabrous ovate rounded at the base 4 in., radiate flowers 0.—Nipal.—Of this no specimen exists at Kew. Perhaps it is but a synonym of *H. altissima.* H. f. & T. (*in Journ. Linn. Soc.* ii. p. 76) reduce it to *Dichroa*, but that has not ovate leaves rounded at the base.

8. PILEOSTEGIA, *H.f. & T.*

A glabrous shrub with the habit of *Viburnum* and decussate branches. *Leaves* coriaceous, petioled, obovate-oblong, entire, persistent. *Panicles* terminal. *Calyx*-tube adnate to the ovary; lobes 4 or 5, imbricate. *Petals* 4 or 5, valvate, falling off in a cap. *Stamens* 8 or 10, subepigynous. *Ovary* inferior, 4–6-celled; style thick, surmounted by a thicker truncate pyramid the 4–6 angles of which are stigmatic; ovules numerous, elongate, pendulous. *Seeds* (immature) numerous, testa an elongate cylindric sack at the apex of which lies the nucleus.

1. **P. viburnoides,** *H. f. & T. in Journ. Linn. Soc.* ii. 76, t. ii.; *Maxim. in Mem. Acad. Petersb.* x. No. 16. p. 18.

KHASIA MTS., alt. 3000–5000 ft.; *Griffith*; *T. Lobb*; Nunklow, *J. D. H. & Thomson.*—DISTRIB. Japan, Formosa.

Leaves 3–5 in. *Panicle* with a few linear-lanceolate bracts $\frac{1}{2}$ in. long. *Flowers* small; filaments elongate, $\frac{1}{4}$–$\frac{3}{8}$ in. long.

9. **DICHROA**, *Lour.*

A shrub. *Leaves* opposite, serrate, lanceolate, persistent. *Panicle* terminal. *Calyx*-tube adnate to the ovary; limb 5–6-toothed. *Petals* 5 or 6, thickish, valvate, blue or purplish. *Stamens* 10 or 12, epigynous. *Ovary* $\frac{3}{4}$-inferior, 1-celled; styles 3–5; ovules numerous, on 3–5 parietal placentæ formed by the inflexed margins of the carpels. *Berry* $\frac{3}{4}$-inferior, blue. *Seeds* numerous, small, obovoid; testa with large reticulations.

1. **D. febrifuga,** *Lour. Fl. Cochinch.* 301; *Benth. Fl. Hongk.* 128; *Maxim. in Mem. Acad. Petersb.* x. No. 16, p. 2. D. cyanitis and D. latifolia, *Miq. Fl. Ind. Bat.* i. 721, 722. Adamia versicolor, *Fortune in Journ. Hort. Soc.* i. 298; *Lindl. & Paxt. Fl. Gard.* i. t. 5. A. cyanea, *Wall. Cat.* 441; *Tent. Fl. Nep.* t. 36; *Pl. As. Rar.* t. 213; *Bot. Mag.* t. 3046; *DC. Prodr.* iv. 16; *H. f. & T. in Journ. Linn. Soc.* ii. 76. A. chinensis, *Gardn. & Champ. in Kew Journ. Bot.* i. 311. Cyanitis sylvatica, *Reinw. in Blume Bijd.* 921; *DC. Prodr.* iv. 16.

TEMPERATE HIMALAYA from BHOTAN to NIPAL, alt. 5000–8000 ft., abundant. KHASIA MTS., alt. 4000–6000 ft.—DISTRIB. Java, China, Philippines.

Stems 5–9 ft. high, somewhat virgate. *Leaves* 3–8 in., tapering into the petiole, pubescent or puberulous on the nerves, otherwise glabrous, usually narrow, sometimes obovate-lanceolate. *Petals* $\frac{3}{16}$ in. long. *Berry* finally an intense blue.—The Chinese varieties have larger flowers than the Indian.

10. **DEUTZIA**, *Thunb.*

Shrubs with opposite branches and stellate pubescence. *Leaves* opposite serrate, ovate or lanceolate, deciduous. *Flowers* white, corymbose in the Indian species. *Calyx*-tube adnate to the ovary; teeth 5, small. *Petals* 5. *Stamens* 10, subepigynous, filaments broadly winged the wing often ending upwards in a tooth on each side. *Ovary* inferior, 3–5-celled; styles 3–5, long; ovules numerous, axile. *Capsule* 3–5-celled, hemispheric or ovoid from a rounded base, truncate at the summit, at length septicidal. *Seeds* minute, numerous, obovoid-ellipsoid; testa reticulate, a little longer than the nucleus, appearing at last as a short stalk at its base, as a point at its summit.—DISTRIB. Species 7, Himalaya to North China and Japan; and one outlier in Mexico.

1. **D. corymbosa,** *Br. in Royle Ill.* t. 46; petals obovate imbricate, calyx teeth short triangular, calyx-tube with scattered stellate hairs, corymbs many flowered, *Wall. Cat.* 3652; *H. f. & T. in Journ. Linn. Soc.* ii. 83, *excluding synonyms in Bot. Reg.*; *Brand. For. Fl.* 212; *Maxim. in Mem. Acad. Petersb.* x. No. 16, p. 32. ? D. parviflora, *Bunge Enum. Pl. Chin.*, p. 30; *Maxim. in. Mem. Acad. Petersb.* x. No. 16, p. 33, *with figures.* Philadelphus (Leptospermum) corymbosus, *Wall. in Herb.*

TEMPERATE HIMALAYA, from KASHMIR to BHOTAN, alt. 6000–10,000 ft., frequent. —DISTRIB. China, Mantchuria, Amurland.

Leaves 1–2 in., oblong or elliptic lanceolate; on the under surface the stellate hairs are often few, sometimes thickly scattered, not matted into tomentum in the mature leaves; under surface sometimes prominently reticulate. *Petals* glabrous or stellately pubescent.—Maximowicz l. c. keeps the Chinese *D. parviflora* still distinct by the puberulous smaller petals, the shorter teeth to the wing of the filament, the leaves more prominently reticulate beneath, &c., none of which distinctions appear to hold in the large Kew collection. The name *corymbosa* can only be preferred to *parviflora* if Brown's naming in Wallich's distribution be reckoned publication.

2. **D. staminea,** *Br. in Wall. Pl. As. Rar.* 82, t. 191; petals oblong induplicate-valvate, corymbs many-flowered, calyx-tube hoary tomentose with stellate hairs, teeth short triangular. *Wall. Cat.* 3651; *Bot. Reg.* xxxiii. t. 13; *H. f. & T. in Journ. Linn. Soc.* ii. 83; *Brandis Forest Fl.* 212; *Maxim. in Mem. Acad. Petersb.* x. No. 16, p. 29. D. Brunoniana, *Wall. Cat.* 3650. D. corymbosa, *Lindl. Bot. Reg.* xxvi. *t.* 5. Leptospermum stamineum and L. scabrum, *Wall. in Herb.*

TEMPERATE WESTERN HIMALAYA to KASHMIR, alt. 5000–9000 ft., common. The specimens collected by Sir J. D. Hooker in Sikkim and East Nipal and named *D. staminea* should be referred to *D. corymbosa.*

Leaves 1–2 in., oblong- or elliptic-lanceolate, grey tomentose beneath with stellate hairs.

3. **D. macrantha,** *H. f. & T. in Journ. Linn. Soc.* ii. 84; petals $\frac{3}{4}$ in. long oblong induplicate-valvate, corymb large 8-flowered, calyx-tube with stellate tomentum, teeth linear.

Western Himalaya; KUMAON, alt. 5500 ft.; below Binsur, *Strachey & Winterbottom.*

Leaves 4 in., elliptic-lanceolate from a rounded base, acuminate, with close scattered stellate hairs on both surfaces.

11. PHILADELPHUS, *Linn.*

Shrubs with opposite branches. *Leaves* opposite, deciduous. *Calyx*-tube adnate to the ovary; lobes 4 (rarely 5), valvate. *Petals* 4 (rare 5) roundish, convolute in bud. *Stamens* 20–40, subepigynous, filaments subulate. *Ovary* inferior, 3–5-celled; styles 3–5, filiform, free or combined at the base; ovules numerous, axile, pendulous. *Capsule* inferior, corky, 3–5-celled, turbinate from a narrow funnel-shaped base, the summit shortly conical, at length loculicidal. *Seeds* numerous, oblong, testa loosely reticulated.—DISTRIB. Species 8; central Europe, the Himalaya, Japan and N. America.

1. **P. coronarius,** *Linn*; var. TOMENTOSUS; leaves hairy beneath, margins densely hairy or glabrous except a few marginal hairs. P. tomentosus, *Wall. Cat.* 3563; *Royle Ill.* t. 4; *H. f. & T. in Journ. Linn. Soc.* ii. 83. P. triflorus, *Wall. and* P. nepalensis, *Loud. ex Maximov. in Mem. Acad. St. Petersb. No.* 16, 36. P. coronarius, *Brand. For. Fl.* 212.

Temperate Himalaya; from KASHMIR to BHOTAN, alt. 5000–9000 ft.; frequent in GURWHAL and KUMAON.

Leaves $1\frac{1}{2}$–$3\frac{1}{2}$ in., ovate-lanceolate, serrate; petiole $\frac{1}{4}$ in. *Cymes* few-flowered, often with linear bracts $\frac{1}{2}$ in. long; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. *Calyx*-teeth elongate-triangular, acute. *Petals* $\frac{1}{3}$–$\frac{1}{2}$ in. long, white. *Capsule* $\frac{1}{2}$ in. long.—The typical *P. coronarius* (of which *Zeyheri, floribundus, verrucosus, latifolius,* and many others are varieties) is a native of Europe and the East, extending to North China and Japan.

12. ITEA, *Linn.*

Shrubs or trees. *Leaves* alternate, petioled, glabrous, glandular-dentate or crenate. *Racemes* axillary and terminal, long, many-flowered. *Calyx-tube* adnate to base of the ovary, lobes 5. *Petals* 5, oblong, perigynous, white, valvate. *Stamens* 5, perigynous. *Ovary* $\frac{3}{4}$-superior, 2-celled; style short, simple; ovules

many, axile. *Capsule* ¾-superior, conical or elongate, many-seeded, splitting through the dissepiments and the style. *Seeds* elongate, testa loose more or less produced at each end.—DISTRIB. Species 5, the Himalaya, Indian Archipelago, Japan, Virginia.

1. **I. macrophylla,** *Wall. in Roxb. Fl. Ind.* ii. 419; leaves large rounded at the base, petals closely reflexed on the pedicel between the calyx-teeth, calyx-tube in fruit somewhat campanulate. *Wall. Cat.* 7200; *DC. Prodr.* iv. 6; *H. f. & T. in Journ. Linn. Soc.* ii. 77. Kurrimia ?, *Wall. Cat.* 7200.

Subtropical Eastern Himalaya; BHOTAN and SIKKIM, alt. 1000–4000 ft., *Griffith, Gamble.* KHASIA MTS., alt. 2000–4000 ft., frequent.—DISTRIB. Java.

A small tree. *Leaves* often 6 by 3 in., broadly ovate, acute, glandular-denticulate, but sometimes not larger than in *I. chinensis* nor more rounded at the base. *Racemes* 1–3 from several upper axils, usually shorter than the leaves, and like the calyx-tube puberulous. *Capsule* ¼–⅜ in. long, the bases of the carpels clearly sunk below the limb of the calyx-tube; the calyx-teeth finally wear off.

2. **I. chinensis,** *Hook. & Arn. Bot. Beech. Voy.* 89, t. 39; leaves usually narrowed at the base, petals erect persistent often appressed to the fruit, calyx-tube in fruit turbinate or conical. *H. f. & T. in Journ. Linn. Soc.* ii. 77; *Benth. Fl. Hongk.* 129.

KHASIA MTS., alt. 4000–5000 ft., *Wallich,* &c.—DISTRIB. China, Hong Kong, Formosa, &c.

A shrub. *Leaves* usually 3 or 4 in., oblong, narrowed at both ends, glandular-denticulate, but sometimes 6 in. by 2½ in. and exactly resembling those of *I. macrophylla.* *Racemes* 1–2 from several upper axils, about as long as the leaves, and like the calyx-tube puberulous. *Capsule* ¼–⅜ in., bases of the carpels hardly sunk below the calyx-tube; calyx-teeth persistent, suberect.

3. **I. nutans,** *Royle Ill.* 226; petals erect subpersistent, calyx-tube in fruit hemispherical hairy, racemes solitary terminal elongate much longer than the leaves. *H. f. & T. in Journ. Linn. Soc.* ii. 77; *Brand. For. Fl.* 213.

GURWHAL and KUMAON, alt. 3000–5000 ft., *Royle,* &c.

A shrub. *Leaves* 3–5 in., elliptic-oblong, acute, glandular-denticulate. *Capsule* ⅕ in. long; calyx-teeth persistent, erect.

13. **POLYOSMA,** *Blume.*

Evergreen trees, branchlets petioles and inflorescence pubescent. *Leaves* opposite or subopposite, petioled, acuminate. *Flowers* in terminal racemes (in some non-Indian species solitary) 3-bracteolate. *Calyx-tube* entirely adnate to the ovary; lobes 4, small, persistent. *Petals* 4, epigynous, linear, valvate, white yellowish or greenish expanding by recurving, fugacious, very hairy within. *Stamens* 4, epigynous, filaments hairy. *Ovary* inferior, 1-celled; style columnar, stigma simple; ovules numerous, ascending, on two parietal placentæ which project considerably into the cavity of the ovary. *Fruit* sub-baccate, 1-seeded. *Seed* ascending, subbasal.—DISTRIB. Species 6, extending from East Bengal through Malaya to tropical Australia and its islands.

1. **P. fragrans,** *Benn. Pl. Jav. Rar.* p. 196; leaves entire obovate-lanceolate drying green, flowers sessile, fruits (ex Miq.) small globose rostellate. *H.*

f. & T. in Journ. Linn. Soc. ii. 77; *Miq. Fl. Ind. Bat.* 1, pt. i. 724; *Suppl.* i. 336. Itea fragrans, *Wall. in Roxb. Fl. Ind.* ii. 420; *Wall. Cat.* 8472, *partly.*

SINGAPORE, *Wallich.*—DISTRIB. Sumatra.

Bark of the twigs not lenticellate. *Leaves* 2–4 in., usually pubescent on the nerves on both surfaces. Lower *flowers* on the raceme ¼ in. long, quite sessile, yellowish.

2. **P. integrifolia,** *Blume Bijd.* 659; leaves entire or denticulate, lanceolate narrowed at both ends drying black, flowers shortly pedicelled, fruits ⅓–½ in. long smooth ellipsoid acute at both ends. *Benn. Pl. Jav. Rar.* p. 196; *DC. Prodr.* iv. 276; *Blume Mus. Bot.* i. 260; *H. f. & T. in Journ. Linn. Soc.* ii. 77; *Miq. Fl. Ind. Bat.* i. pt. i. 724; *Suppl.* i. 335. Itea fragrans, *Wall. Cat.* 8472, *partly.* P. Wallichii, *Kurz For. Fl. Brit. Burm.* i. 444.

KHASIA MTS., alt. 3000–4000 ft., *De Silva, J. D. H.,* and *T. Thomson.* ASSAM, *Griffith.* MALAY PENINSULA, *Griffith, Wallich, Maingay.* ANDAMANS, *Kurz.*—DISTRIB. Java, Sumatra.

A tree 60 ft. high (Blume); bark of the twigs lenticellate. *Leaves* often 6–8 in., usually pubescent on the nerves beneath. Lower *flowers* of the raceme ¼–⅜ in. long; pedicels $\frac{1}{24}$–$\frac{1}{16}$ in.—Very near to *P. ilicifolia, Blume* (remarks Mr. Kurz in *Journ. As. Soc.,* 1876, pt. ii. 308) but the flowers are smaller and more hairy, the fruit larger, and the leaves longer and more acuminated. In both Var. 1 and Var. 2 the leaves are sometimes very hairy beneath.

VAR. 1. *typica*; leaves quite entire.

VAR. 2. *Wallichii, Benn. Pl. Jav. Rar.* p. 196; *Wall. Cat.* 8471; *H. f. & T. in Journ. Linn. Soc.* ii. 77; leaves denticulate.

3. **P. mutabilis,** *Blume Mus. Bot.* i. 261; leaves leathery narrow-obovate acute drying green-yellow, flowers pedicelled very tomentose, fruit ¼ in. long ovoid obscurely rugose ultimately nearly glabrous. *Miq. Fl. Ind. Bat. Suppl.* i. 336. P. lætevirens, *Griff. MSS.*

MALAY PENINSULA; Malacca, *Griffith, Maingay.*—DISTRIB. Java, Sumatra.

A tree 22 ft. high, with a thick trunk (Maingay); branches and leaves variable in their pubescence (even more than in *P. integrifolia*) from dense woolly to nearly glabrous. *Leaves* 3–4 by 1–1¼ in., quite entire, rarely obscurely glandular-denticulate: upper surface sometimes softly hairy, sometimes shining and glabrous, lower always hairy. *Pedicels* $\frac{1}{16}$–⅛ in. long, woolly. *Flowers* ¼–⅜ in. long. *Fruit* erect on the pedicels, the bracteoles remaining horizontal become very prominent.—*P. lætevirens Griff.* is here reduced to *P. mutabilis,* Blume, from Blume's description only.

14. **RIBES,** *Linn.*

Prickly or unarmed shrubs. *Flowers* often unisexual. *Pedicels* bracteate at the base and 2-bracteolate at the middle. *Calyx* adnate to the ovary with 4–5 epigynous lobes, or the calyx-tube produced above the ovary. *Petals* 4–5, small, epigynous, white yellow red or purple-black. *Stamens* 4–5, epigynous. *Ovary* inferior, 1-celled; styles 2, free or connate, stigmas simple; ovules numerous, on 2 parietal placentas. *Berry* oblong or globose, crowned with the calyx, several-seeded.—DISTRIB. Species 56; temp. Europe, Asia, N. America, and the Andes.

SECT. I. **Grossularia.** *Peduncles* 1–3-flowered. Prickly.

1. **R. Grossularia,** *Linn*; *Wall. Cat.* 6835 *and in Roxb. Fl. Ind.* ii. 515; *Eng. Bot.* t. 1292; *H. f. & T. in Journ. Linn. Soc.* ii. 86; *Boiss. Fl. Orient.* ii. 815; *Brand. For. Fl.* 213. R. Himalensis, *Royle Ill.* 225. R. alpestre, *Dcne. in Jacq. Voy. Bot.* t. 75.

Alpine Western Himalaya, from KUMAON to KASHMIR, alt. 9000–12,000 ft.; frequent.—DISTRIB. North and Alpine Europe; the Atlas, Greek and Caucasus ranges.

Prickles usually 3 beneath each axil; stems smooth or with numerous prickly setæ. *Leaves* suborbicular, obtusely 3–5-lobed, the lobes incise-crenate, somewhat villous beneath. *Peduncles* usually solitary. *Calyx-tube* long, produced above the fruit. *Berry* ½ in. long, oblong, inedible in the Indian plant.

SECT. II. **Ribesia.** *Flowers* racemed. Unarmed.

* *Calyx-tube hardly produced above the fruit.*

2. **R. orientale,** *Poir. Dict. Suppl.* ii. 856; sticky glandular and minutely hairy, leaves round-reniform crenate obscurely 3–5-lobed, bracts ⅕ in. long, linear often exceeding the pedicels, berry ⅕ in. long yellow or reddish glandular-pubescent. *Boiss. Fl. Orient.* ii. 817; *Brand. For. Fl.* 214. R. leptostachyum, *Dcne. in Jacq. Voy. Bot.* t. 76; *H. f. & T. in Journ. Linn. Soc.* ii. 86. R. villosum, *Wall. Cat.* 6832; *and in Roxb. Fl. Ind.* ii. 514. R. glutinosum, *Jacq. Journ.*

KASHMIR and BALTISTAN, alt. 8000–12,000 ft.; *Jacquemont, Munro, Royle,* &c.—DISTRIB. Cabul, Persia, Armenia, Asia Minor and Greece.

A shrub 6 ft. high, polygamo-diœcious. *Leaves* 1–1¼ in. diam. *Racemes* erect, somewhat dense in flower, lax and pendent in fruit. *Flowers* small, greenish.—*R. heterotrichum,* Ledeb. Ic. Fl. Ross. t. 235, only differs by the eglandular fruits; and there is a whole series of closely allied species from the Altai to Persia.

3. **R. glaciale,** *Wall. in Roxb. Fl. Ind.* ii. 513; stem glabrous, leaves glabrous or with scattered hairs above, bracts ¼–⅕ in. linear-lanceolate usually much exceeding the pedicels, calyx-segments oblong, berries ¼ in. long glabrous or minutely pubescent. *Wall. Cat.* 6833; *H. f. & T. in Journ. Linn. Soc.* ii. 88; *Brand. For. Fl.* 214. R. acuminatum, *Wall. Cat.* 6834.

TEMPERATE and ALPINE HIMALAYA, from BHOTAN to KASHMIR, alt. 7000–12,000 ft.; common and often epiphytic.

Polygamo-diœcious. *Leaves* 1–2 in., cordate, 3–5-lobed, crenate-serrate, the middle lobe often elongate; or simple, cordate-ovate, acuminate, sometimes 4½ in. long. *Racemes* pubescent, sometimes elongate. *Flowers* brownish or pink. VAR. 2. *laciniatum,* H. f. & T. *in Journ. Linn. Soc.* ii. 87 (*sp.*), differs by the calyx-segments lanceolate. (The leaves are often not more laciniate than in examples of *R. glaciale.*)

4. **R. desmocarpum,** *H. f. & T. in Journ. Linn. Soc.* ii. 87; stem glabrescent, leaves softly pubescent beneath, bracts ⅕–¼ in. long linear-lanceolate often exceeding the pedicels, calyx-segments ovate-oblong obtuse, berry ¼ in. long glandular-pubescent.

SIKKIM and BHOTAN, alt. 8500–10,000 ft.; *Griffith*; Lachen in SIKKIM, *J. D. H.*

Diœcious. *Leaves* 1–4 in., cordate, 3–5-lobed, crenate-serrate, the lobes often elongate. *Racemes* pubescent, often elongate. *Flowers* brownish.—Very near *R. glaciale,* Wall., differing chiefly by its very hairy berries.

5. **R. luridum,** *H. f. & T. in Journ. Linn. Soc.* ii. 87; branchlets and leaves glabrous, bracts ⅕ in. long, spathulate-oblong much exceeding the pedicels, calyx-lobes lanceolate, berries glabrous small less than ⅕ in. long.

SIKKIM HIMALAYA, alt. 10,000–12,000 ft.; Lachen, *J. D. H.*

A shrub, 4 ft. high, with erect twigs, polygamo-diœcious. *Leaves* 3–5-lobed, 1 by 1¼ in., lobes crenate-serrate. *Racemes* pubescent, erect in fruit, short. *Flowers* subsessile, chestnut. *Calyx-tube* of the flower subcampanulate.—Very near *R. glaciale*; the leaves are in general outline subreniform while those of *R. glaciale* usually have the middle lobe elongate and acuminate.

** *Calyx-tube produced above the fruit.*

6. **R. nigrum,** *Linn.*; *DC. Prodr.* iii. 481; branches and leaves nearly glabrous, racemes pubescent long pendulous, bracts $\frac{1}{16}$–$\frac{1}{8}$ in. long narrow, berry black. *Eng. Bot.* t. 1291; *H. f. & T. in Journ. Linn. Soc.* ii. 88; *Boiss. Fl. Orient.* ii. 815; *Maxim. in Bull. Acad. Petersb., Mel. Biol.* ix. 222; *Brand. For. Fl.* 215.

Temperate Western Himalaya from KUNAWAR to KASHMIR, alt. 7000–12,000 ft., *T. Thomson.*—DISTRIB. North Europe and North Asia.

Leaves in the Kashmir examples not always punctate beneath. *Racemes* long, pendulous; no solitary peduncle at their base. *Pedicels* long. *Flowers* green.

7. **R. Griffithii,** *H. f. & T. in Journ. Linn. Soc.* ii. 88; leaves pubescent on the nerves beneath, racemes 3–6 in. long flexuose pendent very lax, bracts $\frac{1}{4}$–$\frac{1}{5}$ in. long linear-lanceolate exceeding the pedicels, berry ¼ in. long glabrous red.

Eastern Himalaya; BHOTAN, alt. 7500 ft., *Griffith.* SIKKIM, alt. 10,000–13,000 ft., *J. D. H.*

An erect shrub 8 ft. high. *Leaves* 2–3 in., 5-lobed; lobes acuminate or caudate, sharply serrate. *Calyx-tube* in flower and in young fruit broadly campanulate.

8. **R. rubrum,** *Linn.*; *DC. Prodr.* iii. 481; branchlets glabrous, racemes pubescent elongate pendulous, bracts $\frac{1}{16}$–$\frac{1}{8}$ in. long lower often broad or obovate, berry red smooth. *Eng. Bot.* t. 1289; *H. f. & T. in Journ. Linn. Soc.* ii. 89; *Boiss. Fl. Orient.* ii. 816; *Maxim. in Bull. Acad. Petersb., Mel. Biol.* ix. 233; *Brand. For. Fl.* 215. R. Himalayense, *Dcne. in Jacq. Voy. Bot.* t. 77 (*not of Royle*).

Western Himalaya, from KUMAON to KASHMIR, alt. 8000–12,000 ft., frequent; *Royle*, *T. Thomson*, &c.—DISTRIB. Alpine Europe, Caucasus, Altai.

Leaves long-petioled, petioles often ciliate at the base, ovate-cordate, 3–5-lobed; lobes acute, crenate-serrate; upper surface glabrous or with scattered hairs, lower glabrous or pubescent. *Pedicels* short. *Calyx-lobes* short, obtuse. *Flowers* large, greenish-yellow.

? VAR.; berries black, leaves glabrous or pubescent beneath, pedicels very short. Kashmir, alt. 9500 ft.; *Levinge.* Karakorum, alt. 11,500 ft., *C. B. Clarke.* Lahul; *Jaeschke in Brand. For. Fl.* 215.

ORDER LIII. **CRASSULACEÆ.**

Herbs, often with a woody perennial rootstock, or under-shrubs, usually succulent. *Leaves* alternate or opposite, usually simple but divided in *Bryophyllum* and *Kalanchoe*; stipules 0. *Flowers* often cymose, sometimes spicate-racemose in *Cotyledon*, or paniculate in *Bryophyllum*, regular, hermaphrodite or unisexual. *Calyx* 4–5-fid more rarely 6–8-fid, free. *Petals* as many as the sepals, free or connate. *Stamens* hypogynous or upon the petals, as many or twice as many as the petals. *Carpels* usually as many as the petals (fewer in *Triactina* and in a few *Sedums*) with a hypogynous gland or scale at the base of

each; free, or connate below, narrowed upwards into the styles; ovules many on the edges of the carpels (few in *Tillæa, Triactina* and some *Sedums*). *Follicles* dehiscing down the inner faces, many-seeded, or 1- few-seeded in *Tillæa, Triactina* and a few *Sedums*. *Seeds* albuminous; embryo terete, cotyledons short.—DISTRIB. Species 400; spread over nearly the whole globe except Polynesia; rare in Australia and South America; abundant in South Africa; general in the northern hemisphere.

* *Stamens as many as the petals, leaves opposite* (see also *Cotyledon*).

Small herbs with minute axillary sessile flowers . . . . 1. TILLÆA.
Succulent herbs with flowers in a paniculate cyme . . . . . . 2. CRASSULA.

** *Stamens twice as many as the petals.*

† *Petals connate, at least at the base.*

Calyx shortly 4-fid . . . . 3. BRYOPHYLLUM.
Calyx 4-partite . . . . 4. KALANCHOE.
Calyx 5-partite . . . . 5. COTYLEDON.

†† *Petals free.*

Carpels 5–4 (rarely 3) free or slightly connate . . . . 6. SEDUM.
Carpels 6–8 . . . . 7. SEMPERVIVUM.
Carpels 3, connate half their length . . . . 8. TRIACTINA.

1. TILLÆA, *Linn.*

Small glabrous succulent herbs. *Leaves* opposite, entire, flat in the Indian species. *Flowers* minute, axillary, often fasciculate, solitary or cymose, white or red. *Calyx* 4–5-fid. *Petals* 4–5, free or connate at the base. *Stamens* 4–5. Hypogynous *scales* 4–5 or 0. *Carpels* 4–5, free, narrowed into short styles with minute stigmas; ovules 2 to each carpel in the Indian species. *Follicles* 2-seeded.—DISTRIB. A genus of 20 species, widely distributed, scarcely separable from *Crassula*.

1. **T. pentandra,** *Royle Ill.* 222 (*name only*); leaves lanceolate-linear acute, flowers sessile in the axils often 2–3-nate, seeds ellipsoid subtrigonous pointed at the end. *Edgw. in Trans. Linn. Soc.* xx. 50; *H. f. & T. in Journ. Linn. Soc.* ii. 90; *Oliv. Fl. Trop. Afr.* ii. 386. Crassula (Disporocarpa) Schimperi, *Fisch. & Mey. Ind. Sem.* viii. 56.

Subtropical Himalaya, from KUMAON to KASHMIR, alt. 3000–6000 ft., frequent. DECCAN PENINSULA; Mysore, *T. Lobb*; Nilghiris, *Hohenacker*; Concan, *Stocks*.—DISTRIB. Tropical Africa, Abyssinia and the Cameroons.

Stems procumbent, branched; internodes shorter than the leaves. *Leaves* $\frac{1}{4}$–$\frac{5}{16}$ in. long, connate at the base. *Calyx*-segments lanceolate-acuminate, *Petals* elliptic, acuminate, white, not exceeding the sepals. Hypogynous *scales* cuneate, truncate (*ex C. A. Meyer*).

2. **T. pharnaceoides,** *Hochst. in Schimp. Herb. Abyss.* No. 104; leaves ovate-lanceolate or lanceolate, flowers densely clustered in the axils pedicelled, seeds ellipsoid blunt at the end. *Oliv. Fl. Trop. Afr.* ii. 387; *Bth. & H. f. Gen. Pl.* i. 657. T. trichopoda, *Fenzl in Boiss. Fl. Orient.* ii. 767. Combesia abyssinica, *A. Rich. Fl. Abyss.* i. 307. Crassula (Disporocarpa) pharnaceoides, *Fisch. & Mey. Ind. Sem.* viii. 56. C. campestris, *Harv. & Sond. Fl. Cap.* ii. 351.

PUNJAB PLAIN; Hushiarpore, *Aitchison*; Peshawur, *Vicary*.—DISTRIB. Persia, Central and South Africa.

Stem decumbent, branched; internodes longer than the leaves. *Leaves* $\frac{1}{8}$–$\frac{3}{16}$ in. long, connate at the base. *Pedicels* very short or $\frac{1}{4}$ in. long. *Calyx*-segments lanceolate, acuminate. *Petals* shorter than the sepals, united at the base, very acute or hair-pointed. Hypogynous *scales* minute, spathulate (*ex Richard*).—This species is still smaller than *T. pentandra*, its flowers are less than $\frac{1}{20}$ in. long.

2. CRASSULA, *Linn.*

Herbs, usually with thick branches and leaves. *Leaves* opposite, usually connate, fleshy and with cartilaginous margins. *Flowers* cymose, not large. *Calyx* 5-fid or 5-partite. *Petals* 5, free or connate at the base. *Stamens* 5. Hypogynous *scales* various. *Carpels* 5, narrowed into short thick styles; ovules numerous. *Follicles* 5, many-seeded.—DISTRIB. Species 120, nearly all from the Cape of Good Hope; a few in Abyssinia, one in the Himalaya.

1. **C. indica,** *Dcne. in Jacq. Voy. Bot.* t. 73; glabrous, stem 4–12 in. high leafy, radical leaves rosulate spathulate-obovate, cauline acute, cymes forming a compound panicle. *H. f. & T. in Journ. Linn. Soc.* ii. 90. Sedum paniculatum, *Wall. Cat.* 7227.

KUMAON and GURWHAL, alt. 3000–8000 ft., frequent. BHOTAN, *Griffith*.

Lower *leaves* 1–1½ in. long, blunt or shortly acute; stem-leaves sessile, subdecurrent, usually narrow oblong. *Panicle* sparsely leafy. *Petals* dull rose, scarcely twice the sepals. Hypogynous *glands* small, obovate. *Seeds* very numerous, oblong-ellipsoid, smooth, finely reticulate, quasi-striate.

3. BRYOPHYLLUM, *Salisb.*

Tall erect herbs, perennials. *Leaves* opposite, crenate. *Flowers* large, pendent, in spreading panicles with opposite branches. *Calyx* with a long inflated tube; lobes 4, short, valvate. *Corolla* with a campanulate tube and shortly 4-fid limb. *Stamens* 8, in two series, inserted on the middle of the corolla-tube. Hypogynous *scales* 4, obtuse. *Carpels* 4, free or connate at the base, attenuated into long styles; ovules very many. *Follicles* 4, many-seeded.—DISTRIB. Species 4, in tropical Africa; one extending through the tropics of the whole world.

1. **B. calycinum,** *Salisb. in DC. Prodr.* iii. 396; leaves petiolate simple or 3-partite, leaflets oblong or elliptic crenate or subincised-crenate. *Bot. Mag.* t. 1409; *Wall. Cat.* 7205; *Wight in Hook. Bot. Misc.* iii. 100, *with a figure*; *W. & A. Prodr.* 360; *H. f. & T. in Journ. Linn. Soc.* ii. 90; *Oliv. Fl. Trop. Afr.* ii. 390. B. pinnatum, *Kurz in Journ. As. Soc.* 1876, pt. ii. p. 309; Cotyledon rhizophylla, *Roxb. Fl. Ind.* ii. 456. C. pinnata, *Lamk. Dict.* ii. 141. Kalanchoe pinnata, *Pers.*; *Miq. Fl. Ind. Bat.* i. pt. i. 728; *Dalz. & Gibs. Bomb. Fl.* 105.

Tropical plains of INDIA, from the base of the Himalaya to Ceylon and Malacca; universal in Lower Bengal.—DISTRIB. Throughout the tropics of the world; presumed a native of Africa and an introduced plant in Bengal.

Glabrous. *Stems* 1–4 ft. high. *Calyx* 1–1½ in. long, purplish green. *Corolla* globose-octagonal at the base, green, constricted in the middle; the exserted parts reddish-purple. Hypogynous *scales* subquadrate, free or slightly adherent to the carpels. *Fruit* enclosed in the persistent papery calyx and corolla. *Seeds* small, oblong-ellipsoid, smooth, longitudinally obscurely striate.

In the crenatures of the leaves of this plant buds are easily formed which develop, drop off, and at once produce new plants.

4. KALANCHOE, *Adans.*

Erect stout perennial herbs. *Leaves* opposite or the upper alternate. *Flowers* large, erect, in many-flowered subpaniculate cymes. *Calyx* 4-partite, or 4-fid half way down. *Corolla* with a flask-shape tube and spreading 4-fid limb, much exceeding the calyx (yellow in the Indian species), persistent. *Stamens* 8, in two series, adnate to the corolla-tube. Hypogynous *scales* 4, linear or oblong. *Carpels* 4, adnate to the base of the corolla-tube, attenuated into long styles; ovules very many. *Follicles* 4. *Seeds* very many, oblong, ellipsoid, with 8–15 longitudinal ribs.—DISTRIB. Species 25, chiefly in tropical and South Africa; several in tropical Asia; one in Brazil.

* *Calyx divided not more than half way down.*

1. **K. glandulosa,** *Hochst. in A. Rich. Fl. Abyss.* i. 312; very glandular upwards, branches of panicle subopposite, stem-leaves stem-clasping, calyx very glandular-pubescent. *Oliv. Fl. Trop. Afr.* ii. 396. K. Ritchieana, *Dalz. in Hook. Kew Journ.* iv. 346; *Dalz. & Gibs. Bomb. Fl.* 105. K. heterophylla, *Herb. Wight.* Cotyledon hirsuta, *Herb. Heyne.*

MTS. of the DECCAN PENINSULA; *Heyne*; *Wight, Ritchie.*—DISTRIB. Abyssinia.

Stem very thick at the base, 1–2 ft. high. *Leaves* obovate, nearly entire, the lowest 4–6 in. long, much tapering at the base, scarcely petioled. *Calyx*-teeth ovate, acute. *Corolla*-tube ½ in. long. Hypogynous *scales* linear.—This species connects *Kalanchoe* with *Bryophyllum*; it has the tubular calyx and subopposite panicle branches of *Bryophyllum*; but the erect flowers, spreading corolla lobes, narrow hypogynous scales and seeds of *Kalanchoe.* The calyx is described as 'vesicular' in fruit; but it is very slightly so either in the Indian or Abyssinian examples.

** *Calyx divided nearly to the base.*

2. **K. spathulata,** *DC. Pl. Grasses,* t. 65; *Prodr.* iii. 395; glabrous, leaves spathulate-oblong crenate, upper distant and becoming very narrow sometimes 3-foliolate, the lowest bracts similar, lower panicle-branches usually opposite, sepals elongate triangular from a broad base. *Haw. in Phil. Mag. Lond. N.S.* vi. 303; *Miq. Fl. Ind. Bat.* i. pt. i. 728. K. nudicaulis, *Ham. in Herb.* K. crenata, *Oliv. Fl. Trop. Afr.* ii. 394, *partly.* K. varians, *Haw. in Phil. Mag. Lond. N.S.* vi. 302; *Wall. Cat.* 7222, and *Pl. As. Rar.* t. 167 (not good under the name K. amplectens); *H. f. & T. in Journ. Linn. Soc.* ii. 91. K. acutiflora, *Kurz in Journ. As. Soc.* 1876, pt. ii. p. 309, *omitting the synonyms.*

TROPICAL HIMALAYA, from BHOTAN to KASHMIR, alt. 1000–3000 ft.; common. BURMA; *Wallich.*—DISTRIB. Warm China, Java.

Stem 1–4 ft. high. Lower *leaves* commonly 3–4 (sometimes 10) in. long besides the petiole; upper leaves (with the petiole) often 3–4 in. long by ½ in. broad, frequently sessile. *Corymb* flattish or more rarely elongate, with few scattered linear bracts ¼–½ in. long. *Flowers* clear yellow, the corolla-tube glabrous. *Calyx* in fruit often as much as ⅜ in. wide.—This species should probably be united with *K. ægyptiaca* (which hardly differs except by the orange tint of the flowers) and with *K. crenata* as in *Oliv. Fl. Trop. Afr.* ii. 394; but the Indian plant is very constant in its trifling characteristics and habit.

3. **K. floribunda,** *W. & A. Prodr.* 359; upper parts of the stem and cyme with short spreading glandular hairs, lower branches of the cyme usually

alternate, upper branches often long racemiform, sepals oblong acute standing apart at base. *H. f. & T. in Journ. Linn. Soc.* ii. 91. K. Wightiana, *Wall. Cat.* 7225. Cotyledon amplexicaulis, *Heyne in Herb. Rottl.*

MTS. of the DECCAN PENINSULA, alt. 2000–7000 ft.; common.

Stem 1–3 ft. high. *Leaves* obovate-elliptic crenate, cauline 2–3 in. long, petiole short. *Cyme* with very many flowers. *Corolla* clear yellow, tube glabrous.

VAR. *glabra*; cyme often level-topped, the branches perfectly glabrous not at all racemose with numerous approximate small lanceolar bracts $\frac{1}{8}$ in. long, calyx-tube in fruit $\frac{1}{8}$–$\frac{1}{5}$ in. wide. K. floribunda, *Thwaites Enum.* 129. K. spathulata, *Wall. Cat.* 7224. Cotyledon heterophylla, *Roxb. Fl. Ind.* ii. 456. C. corymbosa, *Herb. Rottl.*—MTS. of the Deccan Peninsula; extending to CEYLON (Thwaites No. 540) and Parasnath in BEHAR, alt. 4000 ft. *J. D. H.*—This should perhaps be united with *K. crenata*; it differs from *K. spathulata* by the wider (elliptic) upper leaves, the much narrower capsule, the cyme less paniculate.

4. **K. grandiflora,** *W. & A. Prodr.* 359; glabrous, leaves broadly obovate crenate, cyme large compound with large green-yellow flowers, sepals ovate-lanceolate. *Wall. Cat.* 7226; *Wight Ill.* t. 111; *H. f. & T. in Journ. Linn. Soc.* ii. 91; *Bot. Mag.* t. 5460.

NILGHIRI and PULNEY MTS., alt. 7000–8000 ft.; *Gardner, Wight*, &c.

Stem, leaves, and panicle often glaucous. *Stem-leaves* 2–3 in. long, subsessile. *Bracts* of cyme $\frac{1}{2}$–$\frac{3}{4}$ in. long, elliptic, petioled, early deciduous. *Sepals* united at base for a distance often $\frac{1}{8}$ in. or more.—All the well-developed examples of *K. Wightiana, Wall. Cat.* 7225 belong to *K. floribunda* Var. above; but under *Wall. Cat.* 7225 are included several young examples of *K. grandiflora*.

5. **K. brasiliensis,** *Camb. in Fl. Bras. Merid.* ii. 196; cyme densely glandulose-pubescent, corolla-tube and lobes without very hairy. *Mart. Fl. Brasil.* t. 89. K. crenata, *Oliv. Fl. Trop. Afr.* ii. 394, *partly*.

MTS. of the DECCAN PENINSULA; Tovequary Hill in Belgaum and North Deccan Hills, *Ritchie*.—DISTRIB. Brazil, Tropical Africa.

Stem-leaves $\frac{3}{4}$ in. long, elliptic, short petiolate, crenate. *Petals* hair-pointed (as in the allied Indian species). *Flowers* white ex Dr. Ritchie's field note; yellow ex Cambess. and Oliver.—If this plant be united with *K. crenata* as proposed by Britten in *Oliv. Fl. Trop. Afr.* ii. 394 the species here described Nos. 2 to 5 may all be included.

6. **K. laciniata,** *DC. Pl. Grasses*, t. 100; *Prodr.* iii. 395; leaves pinnatifid-laciniate, the lobes entire subserrate or dentate, sepals lanceolate subpatent. *Wall. Cat.* 7221; *W. & A. Prodr.* 360; *Wight. Ic.* 1158; *Thwaites Enum.* 129; *H. f. & T. in Journ. Linn. Soc.* ii. 91; *Miq. Fl. Ind. Bat.* i. pt. i. 728; *Dalz. & Gibs. Bomb. Fl.* 105; *Oliv. Fl. Trop. Afr.* ii. 392. K. teretifolia, *Haw. in Wall. Pl. As. Rar.* 53, t. 166; *Wall. Cat.* 7223; *H. f. & T. in Journ. Linn. Soc.* ii. 91; *Kurz in Journ. As. Soc.* 1876, pt. ii. p. 309. Cotyledon laciniata, *Roxb. Fl. Ind.* ii. 456.

TROPICAL regions of the DECCAN PENINSULA; in BENGAL at Patna, Dacca. BURMA, *Wallich*. MALACCA, *Maingay*.—DISTRIB. Yunan, Java, Tropical Africa.

VAR. 1. *typica*; leaves once pinnatifid, segments $\frac{1}{4}$–1 in. broad flat incise-crenate sometimes bipinnatifid; cyme-branches and sepals often glabrous.

VAR. 2; leaves 2–3-pinnatifid, segments linear, cyme-branches and sepals pubescent.

K. teretifolia, Wall. does not appear separable from this var. K. acutiflora, *Haw. in Andr. Bot. Repos.* t. 560; *Miq. Fl. Ind. Bat.* i. pt. i. 728, probably is not an Indian form; it has white flowers.

5. COTYLEDON, *Linn.*

Herbs, branching or scapigerous. *Leaves* opposite or alternate, fleshy. *Flowers* in spicate racemes or cymose. *Calyx* 5-partite. *Corolla* 5-fid to the base (or in non-Indian species less deeply). *Stamens* 10 or 5, inserted on the corolla. Hypogynous *scales* oblong or quadrate. *Carpels* 5, free, attenuated into filiform styles; ovules very numerous. *Fruit* of 5 many-seeded follicles.—DISTRIB. Species 60; in Eastern Asia, Western and Southern Europe and the whole of Africa; also in Mexico.

The genus as it now stands includes such species as are excluded from *Crassula* by their alternate leaves, and from *Sedum* by their spicate racemes or by having only 5 stamens.

* *Stem simple, leaves alternate, spike elongate dense, stamens* 10.

1. **C. spinosa,** *Linn. Sp. Pl.* i. 615; radical leaves rosulate spathulate terminated by a spine, cauline oblong-lanceolate flat, pedicels 1-flowered, corolla yellow-white twice exceeding the calyx. Umbilicus spinosus, *DC. Prodr.* iii. 400; *Ledeb. Fl. Ross.* ii. 174. U. spinosus and U. fimbriatus, *Turcz. Fl. Baikal-Dahur,* i. 432. Sedum spinosum, *Thunb. Fl. Jap.* 186.

WEST TIBET; *Falconer* No. 482. BALTISTAN, alt. 10,000–11,000 ft., *C. B. Clarke.*
Height 6–15 in. *Leaves* 1–1½ in. long. *Pedicel* ¼ in. long, shorter than its oblong acute bract. *Sepals* ovate, very acute, greatly exceeding the tube of the corolla.

** *Stems several, leaves alternate, cymes small, stamens* 5.

2. **C. Oreades,** *C. B. Clarke*; annual, glabrous, stems branching from the base, branches ascending leafy, leaves on the sterile branches ¼ in. long, rosulate narrow lanceolate aristate, flowers at the summit of the branches 3–1 nodding white. Umbilicus Oreades, *Dcne. in Jacq. Voy. Bot.* 62 (U. luteus, *Ic.* t. 73, except that the stamens are not ten); *H. f. & T. in Journ. Linn. Soc.* ii. 91.

Alpine Western Himalaya; KASHMIR; Pir Punjal, *Jacquemont*; Marbul Pass, *C. B. Clarke.* GURWHAL, *Falconer.* KUMAON, alt. 14,000 ft.; Shilong, *Strachey & Winterbottom.*
Stems 2–4 in. long, several, curved. Stem-*leaves* like the rosulate leaves but rather smaller. *Sepals* ¼ in. long, oblong, acute. *Petals* a little exceeding the sepals, united at their base only. *Seeds* ellipsoid, microscopically covered with tubercles.—This species has the habit altogether of *Sedum*, but it cannot be put there because it has only 5 stamens; neither can it be put in *Crassula* because *Crassula* has always opposite leaves. Therefore it is put in *Cotyledon*; though in *Cotyledon* the corolla should be tubular, the tube at least equalling the calyx. Similar remarks apply to the next species.

3. **C. spathulata,** *C. B. Clarke*; glabrous, stolon leaves rosulate ½ in. long petioled spathulate, cauline linear-oblong, flowers corymbose shortly pedicelled, sepals ¼–⅜ in. long oblong acute nearly equalling the corolla and many times exceeding its tube. Umbilicus spathulatus, *H. f. & T. in Journ. Linn. Soc.* ii. 92.

SIKKIM HIMALAYA, alt. 10,000–12,000 ft., *J. D. H.*

Stems 3-6 in. high, throwing decumbent stolons from the base. Cauline *leaves* ¼ in. long, sessile. *Petals* united at base only. *Stamens* 5. *Flowers* sometimes 4-merous. *Seeds* ellipsoid, smooth, tailed.

6. **SEDUM,** *Linn.*

Succulent herbs. *Leaves* alternate or rosulate, rarely opposite; entire or laciniate. *Flowers* cymose, hermaphrodite, or unisexual by abortion. *Calyx* 5-4-partite. *Petals* 5–4, free. *Stamens* 10–8, the alternate ones adnate to the petals. Hypogynous *scales* quadrate or cuneate, entire or emarginate. *Carpels* 5-4, free or slightly united at base, narrowed into the styles; ovules very numerous. *Follicles* 5–4, many-seeded.—DISTRIB. Species 130; mostly in the cold and temperate regions of the northern hemisphere; one species is found in Abyssinia and one in Peru.

SECT. I. **Rhodiola.** *Rootstock* perennial, thick, suberect, with a crown of scales from the axils of which rise the simple leafy annual stems carrying terminal cymes. *Flowers* diœcious or polygamous, often 4-merous. *Petals* in the males often much exceeding the sepals; in the females shorter or narrower. *Styles* usually short, recurved in fruit. *Seeds* oblong-ellipsoid, compressed, testa loose produced beyond the end of the nucleus, often as a bent short tail.

* *Cymes dense, not carrying bracts on the short branches (though there are frequently bracts at the base of the outer branches).*

1. **S. Rhodiola,** *DC. Prodr.* iii. 401; leaves obovate or broadly oblong often toothed towards the apex, petals yellow, hypogynous scales in the males oblong emarginate. *Ledeb. Fl. Ross.* ii. 179; *H. f. & T. in Journ. Linn. Soc.* ii. 95. S. imbricatum, *H. f. & T. in Journ. Linn. Soc.* ii. 101. Rhodiola imbricata, *Edgw. in Trans. Linn. Soc.* xx. 47. R. rosea, *Linn.*; *Engl. Bot.* t. 508.

ALPINE WESTERN HIMALAYA; from KUMAON to KASHMIR, alt. 12,000–17,000 ft.; frequent.—DISTRIB. The arctic and alpine regions of America, Europe and Asia.

Very glaucous. *Rootstock* having an odour of roses. *Stems* 3–15 in., thick. *Leaves* ½–1½ in. long, imbricated (often very closely) from a narrow or broad base. *Cyme* densely congested. *Sepals* narrow oblong. *Stamens* long, exsert. *Carpels* in fruit ⅕ in. long, not narrowed gradually at the base.—The examples of *S. imbricatum* have diœcious (or functionally diœcious) heads; and the carpels have short recurved styles, altogether as in Sect. *Rhodiola.*

2. **S. heterodontum,** *H. f. & T. in Journ. Linn. Soc.* ii. 95; leaves ovate incise-dentate from a broad or cordate or auriculate base prominently white-margined, flowers rose-coloured ? (ex H. f. & T.). S. serratum, *Jacquem. Journ.*

TEMPERATE and ALPINE WESTERN HIMALAYA, alt. 8000–14,000 ft.; Kashmir, *Jacquemont*; Kunawur, *T. Thomson*; Mandala, *Cleghorn.*

Stems 12–18 in. *Leaves* loosely imbricate. *Cyme* very dense, especially in fruit. Otherwise agrees closely with *S. Rhodiola,* of which H. f. & T. suggest it may be a variety.

3. **S. crenulatum,** *H. f. & T. in Journ. Linn. Soc.* ii. 96; leaves elliptic or broad oblong sessile crenulated, cymes sessile enclosed by the upper leaves and outer leaf-like bracts, sepals purple narrow-oblong, petals rose-coloured.

SIKKIM HIMALAYA, alt. 12,000–18,000 ft.; Yeumtong and Mt. Donkiah, *J. D. H., W. T. Blandford.* KUMAON, alt. 12,000–17,000 ft., Chumpua and Niti Pass, *Strachey & Winterbottom.*

Dried specimens are a ruddy chestnut colour. *Stems* 3–8 in.—Very like *S. Rhodiola,* of which it may be a variety.

** *Cymes* 1- *few-flowered* (*except* S. tibeticum), *or in fruit somewhat lax, branches not bearing leaves* (*though there may be bracts at their bases*).

4. **S. tibeticum,** *H. f. & T. in Journ. Linn. Soc.* ii. 96; leaves subentire oblong or ovate-oblong, cymes 4–20-flowered not very dense in fruit, flowers often 5-merous, sepals on the fruit triangular-acuminate.

ALPINE WESTERN HIMALAYA, alt. 12,000–16,000 ft.; KUNAWUR (Werang Pass) *T. Thomson*; LAHUL, *Jaeschke.*—DISTRIB. Cabul, *Griffith.*

Glabrous. *Stems* 4–10 in. *Leaves* $\frac{1}{3}$–$\frac{1}{2}$ in., loosely imbricate, the upper oblong subacute, the lower often ovate. *Petals* rose or purple. *Follicles* and seeds as in *S. Rhodiola.*

VAR. *Stracheyi,* H. f. & T. in Journ. Linn. Soc. ii. 96 (sp.); leaves ovate often toothed. Alpine Western Himalaya, alt. 12,000–17,000 ft., *T. Thomson, Strachey & Winterbottom, Dr. Henderson.*—The leaves sometimes entire, and the upper oblong: it then seems undistinguishable from *S. tibeticum.*

5. **S. quadrifidum,** *Pall.*; *DC. Prodr.* iii. 407; stems 2–5 in. numerous, leaves approximate oblong subterete, cymes 5–1-flowered, flowers red often 4-merous, sepals oblong. *Ledeb. Fl. Ross.* ii. 177; *H. f. & T. in Journ. Linn. Soc.* ii. 97. S. coccineum, *Royle Ill.* t. 48.

ALPINE WESTERN HIMALAYA, alt. 11,000–18,000 ft., from KUMAON to KASHMIR, frequent. SIKKIM, alt. 16,000–18,000 ft., *J. D. H.*—DISTRIB. Arctic Russia and Siberia.

Stems and leaves glabrous or puberulous. *Leaves* $\frac{1}{4}$ in., sometimes very acute. *Petals* usually twice the sepals. Hypogynous *scales* subquadrate (ex H. f. & T.). *Follicles* with short styles, recurved or sometimes erect, straight.

*** *Cymes lax, branches bearing leaves, or the flowers supported by a leafy bract.*

6. **S. Himalense,** *Don Prodr.* 212; leaves $\frac{1}{3}$–$\frac{2}{3}$ in. loosely imbricate narrow-obovate or lanceolate often dentate towards the summit, cymes large leafy, sepals lanceolate-linear, petals deep purple twice the sepals, pedicels much thickened under the fruit. *DC. Prodr.* iii. 402; *H. f. & T. in Journ. Linn. Soc.* ii. 97. S. Himalayanum and S. hypericifolium, *Wall. Cat.* 7236, 7237.

SIKKIM and NIPAL, alt. 12,000–17,000 ft., frequent; *Wallich, J. D. H.,* &c.

Stems 4–14 in., usually puberulous or pubescent, sometimes glabrous. *Petals* lanceolate. Hypogynous *scales* black-purple, broadly triangular (ex H. f. & T.). *Follicles* $\frac{1}{4}$ in. long, black-purple.—*S. atropurpureum,* Turcz. of Central Asia differs among other things by its compact cyme.

7. **S. bupleuroides,** *Wall. Cat.* 7229; leaves $\frac{1}{2}$–$1\frac{1}{4}$ in. long loosely imbricate ovate or ovate-oblong, base cordate or auriculate-bilobate, cymes large leafy, sepals lanceolate-linear, petals lanceolate small black-purple twice the sepals. *H. f. & T. in Journ. Linn. Soc.* ii. 98.

NIPAL; Gossain Than, *Wallich.* SIKKIM, alt. 10,000–14,000 ft.; Tungu, Lachen *J. D. H.*

Stems 6–14 in. high, glabrous, or the cyme puberulous. Hypogynous *scales* black purple, broadly cuneate-quadrate (ex H. f. & T.).

8. **S. elongatum,** *Wall. Cat.* 7233; leaves ¾–2 in. long loosely imbricate oblong narrowed at base almost petioled or elliptic sessile, cymes large loose, petals lanceolate black-purple. *H. f. & T. in Journ. Linn. Soc.* ii. 98.

Alpine Himalaya, from Sikkim to Kashmir, alt. 10,000–12,000 ft.
Stems 8–20 in. high, glabrous, as are the leaves. *Cymes* puberulo-pubescent. *Sepals* lanceolate-linear. Hypogynous *scales* broad, cuneate-quadrate (ex H. f. & T.). *Follicles* scarcely ¼ in.

9. **S. fastigiatum,** *H. f. & T. in Journ. Linn. Soc.* ii. 98; stems numerous, leaves ¼–⅓ in. long crowded terete oblong-linear, cymes 3–8-flowered, sepals lanceolate, petals ⅕ in. long linear twice the sepals.

Sikkim, alt. 14,000–17,000 ft.; Kankola, Lama Kangra, *J. D. H.*
Stems 2–5 in., curved, glabrous, as are the leaves. *Cymes* puberulo-pubescent. Hypogynous *scales* quadrate. *Follicles* more than ¼ in. long, black-purple.—A species resembling *S. quadrifidum* but larger with larger flowers and fruit.

10. **S. humile,** *H. f. & T. in Journ. Linn. Soc.* ii. 99; densely tufted, stems 1–2 in. glabrous or minutely pubescent, leaves ¼–⅓ in. long, linear or linear-oblong, cymes 1–4-flowered, sepals ovate acuminate, petals lanceolate wider upwards twice the sepals.

Sikkim, alt. 15,000–16,000 ft.; Yeumtong and Tunkra Pass, *J. D. H.*
Flowers large for so small a plant. Hypogynous *scales* broad quadrate (ex H. f. & T.).—This species is distinct from the other Indian species by its sepals.

11. **S. coriaceum,** *Wall. Cat.* 7238; rootstock thick, stems numerous pubescent, cymes and leaves on both surfaces puberulous, leaves ⅓ in. flat obovate, cyme with few leaves. *H. f. & T. in Journ. Linn. Soc.* ii. 99.

Nipal, *Wallich.*
Like *S. tibeticum*, var. *Stracheyi*, but wholly puberulous; the leaves obovate and the cymes few-flowered.

Sect. II. *Rootstock* thick. *Flowers* hermaphrodite, rarely imperfect. *Follicles* narrow oblong-lanceolate; style nearly straight, slender, not (or scarcely at all) recurved. *Seeds* ellipsoid, compressed, testa loose produced beyond the end of the nucleus, often as a short bent tail.

12. **S. asiaticum,** *DC. Prodr.* iii. 401; stems 6–12 in., leaves 1–1½ in. approximate near the cyme linear remotely dentate, cymes dense, flowers yellow, petals lanceolate-spathulate twice the sepals. *Wall. Cat.* 7239. S. crassipes, *Wall. Cat.* 7234; *H. f. & T. in Journ. Linn. Soc.* ii. 99. Rhodiola asiatica, *Don Prodr.* 213.

Sikkim to Kashmir, alt. 11,000–16,000 ft., frequent; *Wallich, Falconer, J. D. H.*, &c.

Glabrous or the cyme branches minutely puberulous. Hypogynous *scales* very short, subquadrate (ex H. f. & T.).
Var. *Wallichianum, H. f. & T. in Journ. Linn. Soc.* ii. 100 (*sp.*); *Hook. Ic. Pl.* t. 604; leaves broader more denticulate sometimes subpinnatifid.—H. f. & T. say that this differs by its red flowers; but Sir W. Hooker says that the plants which flowered at Kew had yellow flowers.

13. **S. linearifolium,** *Royle Ill.* t. 48; stems 3–5 in. and with the leaves glabrous, leaves $\frac{1}{2}$–$\frac{3}{4}$ in. imbricate narrow oblong or linear entire or toothed, cymes 2–8-flowered, sepals oblong-lanceolate, petals nearly $\frac{1}{2}$ in. long broad-lanceolate. *H. f. & T. in Journ. Linn. Soc.* ii. 100. S. pauciflorum, *Edgw. in Trans. Linn. Soc.* xx. 49; *H. f. & T.* 100. S. mucronatum, *Edgw. in Trans. Linn. Soc.* ii. 48.

TEMPERATE WESTERN HIMALAYA, alt. 7000–10,000 ft.; GURWHAL, KUMAON, &c.; *Royle, Falconer, T. Thomson,* &c,

A species easily recognised by the large white petals (but H. f. & T. say red?). *Sepals* not ovate in Var. *pauciflorum,* but as in the typical *linearifolium.*—Edgeworth's *S. mucronatum* is identically his *S. pauciflorum* as shown by H. f. & T.

VAR. 1. *typica*; leaves dentate.

VAR. 2. *pauciflorum*; leaves little dentate or entire.

14. **S. trifidum,** *Wall. Cat.* 7230; stems 3–11 in. glabrous, leaves 2–4 in. petioled oblong sinuate-pinnatifid, or 1–2-pinnatifid with linear blunt lobes, cymes branched leafy, sepals narrow-lanceolate, petals linear-lanceolate twice the sepals. *H. f. & T. in Journ. Linn. Soc.* ii. 100. S. sinuatum, *Royle Ill.* p. 222; *Edgw. in Trans. Linn. Soc.* xx. 47.

TEMPERATE HIMALAYA from SIKKIM to KASHMIR, alt. 6000–12,000 ft., common on rocks and on trees.

Cymes leafy. *Flowers* pedicelled, pink. *Follicles* when ripe very thin-walled.—A well-marked abundant species in which however the leaves vary between the wide limits given above.

SECT. III. Annuals, or perennials with no thick rootstock. *Flowers* hermaphrodite. *Seeds* obovoid, not compressed, the testa not loose.

* *Follicles 5, erect in fruit. Radical leaves rosulate.*

15. **S. rosulatum,** *Edgw. in Trans. Linn. Soc.* xx. 48; stems 2–4 in., cauline leaves $\frac{1}{8}$–$\frac{3}{8}$ in. somewhat remote spathulate-obovate or spathulate-orbicular, sepals oblong glabrous rarely minutely pubescent, petals white elliptic or oblong not very acute. *H. f. & T. in Journ. Linn. Soc.* ii. 101. S. pyriforme, *Royle Herb.* Umbilicus radicans, *Klotzsch in Reis. Pr. Waldem. Bot.* t. 44.

KUMAON to KASHMIR, alt. 5000–9000 ft.; frequent, *Royle, Falconer, T. Thomson, Edgeworth,* &c.—DISTRIB. Affghanistan.

Stem glabrous, more rarely glandular-pubescent. Rosulate *leaves* $\frac{1}{4}$–$1\frac{1}{2}$ in. spathulate or elongate obovate. *Cymes* weak, straggling, often subsecund or subscorpioid with long pedicels $\frac{1}{2}$–1 in. long. *Follicles* small, thin-walled, erect. *Seeds* ellipsoid, somewhat obvoid, smooth, longitudinally striate.

16. **S. adenotrichum,** *Wall. Cat.* 7231; stems 3–9 in. glandular-pubescent, cauline leaves $\frac{1}{8}$–$\frac{3}{8}$ in. somewhat remote oblong narrowed below or obovate, sepals oblong minutely pubescent, petals white often with pink stripes lanceolate acute. *H. f. & T. in Journ. Linn. Soc.* ii. 101, *excl. Var. β.*; *Edgw. in Trans. Linn. Soc.* xx. 48; *Baker & Saunders Ref. Bot.* t. 296.

KUMAON to KASHMIR, alt. 3000–8000 ft.; frequent. *Wallich, T. Thomson, Strachey & Winterbottom,* &c.

Rosulate *leaves* $\frac{1}{2}$–$1\frac{1}{2}$ in. spathulate or elongate obovate. *Cymes* lax with pedicels $\frac{1}{4}$–1 in. long, often with two or more erect elongate branches. *Follicles* thin-walled, erect. *Seeds* obovoid, ellipsoid, smooth, longitudinally striate.—This species may be generally distinguished from *S. rosulatum* by its larger size, stronger cyme, and more

pubescent stem and sepals: but the only absolute distinction appears to lie in the more acute petals.

17. **S. Griffithii,** *C. B. Clarke*; stems 2–4 in. very weak glabrous, cauline leaves $\frac{1}{4}$–$\frac{1}{2}$ in. linear, cyme leafy corymbose, sepals narrow oblong, petals white elliptic lanceolate. S. adenotrichum, Var. *β., H. f. & T. in Journ. Linn. Soc.* ii. 101.

BHOTAN; *Griffith.*

H. f. & T. probably joined this with *S. adenotrichum* because of the acute petals; but in all other points, especially its weakness and glabrousness, it is nearer *S. rosulatum.* It differs from both in the linear cauline leaves and particularly in the cyme, which is corymbose and somewhat dense, with linear bracts like the cauline leaves.

18. **S. trullipetalum,** *H. f. & T. in Journ. Linn. Soc.* ii. 102; glabrous, stems 2–4$\frac{1}{2}$ in., cauline leaves $\frac{1}{4}$ in. imbricate lanceolate-linear acute, cymes dense, petals white-yellow with a very long claw and ovate cordate or lanceolate limb.

TEMPERATE and ALPINE HIMALAYA from SIKKIM to KASHMIR, alt. 11,000–16,000 ft.

Rosulate *leaves* $\frac{1}{4}$ in. long, ovate-lanceolate. *Sepals* elliptic-lanceolate, acute.

19. **S. Jaeschkei,** *Kurz in Seem. Journ. Bot.* v. 240; annual, leaves spathulate-oblong acute often rosulate, flowers large golden solitary.

LAHUL, in West Tibet; *Jaeschke.*

Branches 4–5 in. or less, crowded, simple, or branched from the base. Lower *leaves* generally densely rosulate; cauline scattered, smaller, narrower, or crowded towards the end of the branches. *Flowers* solitary at the end of the branches or crowded in dwarf specimens, nearly $\frac{1}{2}$ in. long. *Calyx* segments $\frac{1}{4}$–$\frac{1}{3}$ in. long, fleshy, green, similar to and often larger than the leaves. *Petals* double the sepals, lanceolate, obtuse. *Stamens* less than half the length of the petals.

The above is closely copied from Mr. Kurz, who evidently possessed better materials than certain scraps transmitted to Kew by Jaeschke and referred by Dr. Thomson to *S. asiaticum,* which has not the elongate leafy branches of the corymb.

There are several points however in which Mr. Kurz' description does not fit the flowering slips (3 in. long) at Kew; Mr. Kurz says that the leaves are *shorter* than the sepals which are but 3 to 4 lines long; in the Kew examples the leaves on the corymb branches are $\frac{1}{2}$ in. long and more. The Kew slips may however belong to examples of *S. asiaticum* in its first year of flowering.

20. **S. Ewersii,** *Ledeb. Fl. Alt.* ii. 191; glabrous, stems 4–12 in., cauline leaves $\frac{1}{2}$–1 in. diam. remote obovate or orbicular opposite or some of the uppermost alternate, cymes usually dense, flowers rose-purple. *Ledeb. Fl. Ross.* ii. 182, and *Ic. Fl. Ross.* t. 58; *H. f. & T. in Journ. Linn. Soc.* ii. 102. S. Gerardianum, *Wall. Cat.* 7235. S. azureum, *Royle Ill.* t. 48. S. rubrum, *Royle Ill.* p. 222; *Edgw. in Trans. Linn. Soc.* xx. 47.

TEMPERATE and ALPINE HIMALAYA from KUMAON to KASHMIR, alt. 9000–17,000 ft.; frequent.—DISTRIB. Alpine Siberia and Soongaria.

Leaves fleshy, glaucous, entire or sinuate. *Cymes* sometimes less dense, corymbose with alternate branches. That the flowers are ever blue appears to rest wholly on Royle's figure. *Seeds* ellipsoid, somewhat obovoid, testa not loose.

** *Follicles* 3–5, *divaricate in fruit.*

21. **S. pallidum,** *Bieb. Fl. Taur. Cauc.* i. 353 and iii. 314; stems 1–5 in. annual solitary cymose at top, carpels minutely squamose-tuberculate, seeds

obovoid finely striate longitudinally. *Ledeb. Fl. Ross.* ii. 185; *H. f. & T. in Journ. Linn. Soc.* ii. 102; *Boiss. Fl. Orient.* ii. 790. S. Urvillei, *DC. Prodr.* iii. 408.

PUNJAB PLAIN; Peshawur, *Vicary*; Hurroo and Hassababad, *Aitchison*.—DISTRIB. Affghanistan and thence to Greece.

Glabrous or minutely glandular-pubescent. *Leaves* 1 in., oblong to linear. *Flowers* 5-merous subsessile, white (or rose ex Boissier). *Petals* acute, thrice as long as the triangular acute sepals. *Cyme*-branches minutely glandular, divaricate-recurved in fruit.—A species that has been confounded with *S. multicaule*; it differs in its habitat and is absolutely separate by the seed.

22. **S. multicaule,** *Wall. Cat.* 7232; glabrous, stem 3–8 in. high usually much divided from the base, carpels not tuberculate, seeds obovoid covered with minute tubercles. *H. f. & T. in Journ. Linn. Soc.* ii. 102. S. japonicum, *Sieb. Herb. in Miq. Ann. Mus. Bot. Lugd.-Bat.* ii. 156.

TEMPERATE HIMALAYA, alt. 4000–7000 ft., from KASHMIR to BHOTAN; frequent.—DISTRIB. China and Japan.

Leaves ½–1 in. long, linear-oblong, acute. *Flowers* subsessile, petals yellow. *Cyme* branches divaricate in fruit, usually elongate, subscorpioid.

23. **S. perpusillum,** *H. f. & T. in Journ. Linn. Soc.* ii. 103; glabrous, stems 1–2 in. branching crowded, follicles short oblong turgid small, seeds large (therefore few in each carpel) obovoid hispid with elongate papillæ.

SIKKIM, alt. 12,000 ft., *J. D. H.*

Leaves ⅙ in. long, sessile, oblong or linear. *Cyme* small, leafy. *Flowers* pedicellate, erect. *Sepals* oblong, obtuse. *Petals* white, oblong, a little longer than the sepals. *Follicles* connected ¼ their length.—The specimen referred here by H. f. & T. collected in the Western Himalaya has different seeds; it is in too imperfect a state for identification.

7. SEMPERVIVUM, *Linn.*

Fleshy herbs, often sending up annual flower-stems from a rosette of leaves crowning the perennial rootstock. *Leaves* alternate. *Cymes* paniculate. *Flowers* in the Indian species 8-merous, more rarely 6–8-merous. *Calyx* divided nearly to the base. *Petals* free, or scarcely cohering at the base, oblong-lanceolate. *Stamens* double the number of the petals, free. Hypogynous *scales* small, bifid, united in pairs. *Carpels* equal in number with the petals, free or adnate to the calyx, narrowed upwards into filiform styles; ovules very numerous. *Follicles* many-seeded.—DISTRIB. Species 40, extending from the Canary Islands across South Europe and North Africa to Asia Minor and the Western Himalaya.

1. **S. acuminatum,** *Dcne. in Jacq. Voy. Bot.* t. 74; leaves mucronate glabrous, pedicels and sepals glabrous or slightly ciliate, sepals oblong-lanceolate acuminate scarcely pubescent, *H. f. & T. in Journ. Linn. Soc.* ii. 92. S. himalayense, *Klotzsch in Reis. Pr. Waldem. Bot.* t. 43. Sedum Moorcroftianum, *Wall. Cat.* 7228.

ALPINE HIMALAYA, from KUNAWUR to KASHMIR, alt. 10,000–15,000 ft.; WEST TIBET, *Strachey & Winterbottom*, &c.

Stems 4–8 in. high. Rosulate *leaves* 1–2½ in. long, obovate-lanceolate or nearly linear; cauline ½–¾ in., sessile, oblong, acuminate, but little imbricate. *Cyme* somewhat lax. *Petals* glabrous, purple-rose, twice or thrice the sepals. *Seeds* narrow obovoid, striate longitudinally.

2. **S. mucronatum,** *Edgw. in Trans. Linn. Soc.* xx. 49; basal leaves rosulate mucronate ciliate on the edge or glabrous, sepals glandular-pubescent oblong-lanceolate acuminate. *H. f. & T. in Journ. Linn. Soc.* ii. 92.

ALPINE HIMALAYA, from KUMAON to KASHMIR, alt. 10,000–12,000 ft.; KUMAON, *Strachey & Winterbottom*; NITI, *Edgeworth*; GURWHAL, *Falconer*; Kashmir, *Jacquemont.*

Stems 2–6 in. high. Rosulate *leaves* 1–1½ in. lanceolate; cauline sessile, oblong-lanceolate, more or less pubescent. *Cyme* somewhat dense. *Petals* white, scarcely twice the sepals. *Seeds* narrowly obovoid, striated longitudinally, hardly half so big as in *S. acuminatum.*

3. **S. sedoides,** *Dcne. in Jacq. Voy. Bot.* t. 74; basal leaves rosulate oblong-obovate minutely pilose, sepals oblong or somewhat obovate obtuse or at least not acuminate pubescent, carpels distinctly glandular-pilose upwards. *H. f. & T. in Journ. Linn. Soc.* ii. 93. S. fimbriatum, *Klotzsch in Reis. Pr. Waldem. Bot.* t. 43. S. album, *Edgw. in Trans. Linn. Soc.* xx. 49; *H. f. & T.* l. c. 93.

WESTERN HIMALAYA. Gurwhal, and Pir Punjal KASHMIR, *Falconer*. Kunawur and Kashmir, *Jacquemont.*

Stems 1–3 in. Rosulate *leaves* ¾ in. long; cauline ⅓–½ in. somewhat densely imbricate, sessile, oblong or elliptic, glandular-pubescent. *Cyme* dense. *Petals* lanceolate (white or rose-white ?). *Seeds* narrowly ellipsoid, minutely striate longitudinally.

8. TRIACTINA, *H. f. & T.*

A weak succulent herb. *Leaves* alternate and verticillate. *Flowers* yellow, in lax leafy cymes. *Calyx* 5-partite. *Petals* 5, free, yellow. *Stamens* 10. Hypogynous *glands* 3, linear. *Carpels* 3, connate to the middle; ovules several in each carpel. *Follicles* 3, connate to the middle, divaricate above, 1-seeded.

1. **T. verticillata,** *H. f. & T. in Journ. Linn. Soc.* ii. 103.

SIKKIM, alt. 10,000–12,000 ft.; Lachen, *J. D. H.*; Tumbok, *C. B. Clarke.*

Glabrous. *Stems* 4–10 in. long. *Leaves* ½–1½ in. long, entire, narrowly obovate. *Flowers* subsessile. *Sepals* very small. *Seed* ellipsoid, somewhat obovoid, hispid with elongate papillæ.

This plant by the characters of its carpels and seeds is very closely allied to *Sedum perpusillum H. f. & T. H. f. & T. in Journ. Linn. Soc.* ii. 90 characterise *Triactina* as having polyspermous follicles; the material collected by Sir J. D. Hooker was scanty, and the subsequent collections of C. B. Clarke have all the follicles 1-seeded.

ORDER LIV. DROSERACEÆ. (By C. B. Clarke, F.L.S.)

Herbs; catching insects by means of glandular sticky hairs, or by means of petioled leaves with automatically closing laminæ. *Flowers* hermaphrodite, regular. *Calyx* 4–5- (rarely –8-)partite, or sepals free imbricate persistent. *Petals* and *stamens* as many as the sepals, hypogynous or nearly so. *Ovary* nearly free, globose or ovoid, 1–3-celled; styles 5–3, capitate fimbriate or bifid; ovules numerous, on parietal placentæ equal in number to the styles. *Capsule* membranous 5–3-valved, many-seeded. *Seeds* with fleshy albumen; embryo cylindric or minute.—DISTRIB. Species 110, spread over nearly all temperate and tropical lands except the islands of the Pacific.

Leaves glandular; cauline 0 or alternate . . . . 1. DROSERA.
Cauline leaves whorled vesicular glabrous. . . . . 2. ALDROVANDA.

1. **DROSERA,** *Linn.*

Perennial herbs, scapigerous or with a leafy stem, glandular-pilose. *Leaves* rosulate or alternate, usually circinate in vernation; stipules 0 or scariose and adnate to the petiole. *Calyx* free from the ovary, 4–8-partite, sepals persistent. *Petals* 4–8, hypogynous or scarcely perigynous, white or rose, withering persistent. *Stamens* as many as the petals, hypogynous or scarcely perigynous. *Ovary* 1-celled with 2–5 styles; ovules parietal, numerous. *Capsule* loculicidally 2–5-valved. *Seeds* numerous, in the Indian species obovoid-ellipsoid with the testa black smooth reticulate not lax.—DISTRIB. Species 100, scattered throughout the world except Polynesia; very numerous in Australia.

1. **D. Burmanni,** *Vahl. Symb.* iii. 50; leaves all radical rosulate cuneate-spathulate, stipules equalling half the petiole, scapes 1–3 glabrous, flowers racemose with glabrous pedicels, styles 5 undivided. *Don Prodr.* 212; *DC. Prodr.* i. 318; *Roxb. Fl. Ind.* ii. 113; *Wall. Cat.* 1242; *Wight. Ill.* t. 20 (*the styles incorrect*); *Wight Ic.* t. 944; *W. & A. Prodr.* 34; *Planch. in Ann. Sc. Nat.* ser. iii. vol. ix. 190; *Miq. Fl. Ind. Bat.* i. pt. ii. p. 120; *H. f. & T. in Journ. Linn. Soc.* ii. 82; *Thwaites Enum.* 21; *Dalz. & Gibs. Bomb. Fl.* 12; *Kurz in Journ. As. Soc.* 1876, pt. ii. 310.

Throughout INDIA in the Plains, from CEYLON and Bombay to the base of the HIMALAYA and BURMAH; abundant; ascending to 4000 ft. in the Himalaya, and 8000 ft. in the Deccan.—DISTRIB. China and Japan, Malaya, West Africa, Australia.

Leaves ½–1½ in. long. *Scapes* 2–8 in. high; pedicels erect in fruit. *Calyx* minutely papillose.

2. **D. indica,** *Linn. Sp. Pl.* 403; stem decumbent elongate with alternate long linear leaves, racemes leaf-opposed, styles 3 bifid to the base. *DC. Prodr.* i. 319; *Roxb. Fl. Ind.* ii. 313; *Wall. Cat.* 1244; *Wight Ill.* t. 20 (*the styles incorrect*); *W. & A. Prodr.* 34; *Planch. in Ann. Sc. Nat.* ser. iii. vol. ix. 204; *Miq. Fl. Ind. Bat.* i. pt. ii. p. 120; *H. f. & T. in Journ. Linn. Soc.* ii. 82; *Thwaites Enum.* 21; *Dalz. & Gibs. Bomb. Fl.* 12; *Kurz in Journ. As. Soc.* 1876, pt. ii. 310. D. Finlaysoniana, *Wall. Cat.* 3752. D. serpens, *Planch.* l. c. 204; *Rheede Hort. Mal.* x. t. 20.

CEYLON and the DECCAN as far north as CHOTA NAGPORE, frequent; BURMA and the MALAY PENINSULA (but not known in the Gangetic Plain).—DISTRIB. China, Malaya, Tropical Australia, Africa.

Stems 2–12 in., simple, rarely branched. *Leaves* 1–3 in., very glandular-pubescent, hardly broader than the glabrous petiole. *Racemes* 2–6 in.; pedicels ⅓–⅔ in. *Sepals* lanceolate, minutely glandulose or nearly glabrous. *Seeds* obovoid; testa prominently reticulated, not scrobiculate nor differing essentially from the seeds of the other two Indian species.

3. **D. peltata,** *Sm. in Willd. Sp. Pl.* i. 1546; stem erect leafy, leaves alternate long petioled lunate peltate, sepals ovate glabrous erose or fimbriate, styles 3 fimbriate. *DC. Prodr.* i. 319; *Sm. Exot. Bot.* t. 41 (*wrong as to colour of the flowers*); *Don Prodr.* 212; *Wight Ill.* t. 20; *W. & A. Prodr.* i. 34; *Planch. in Ann. Sc. Nat.* ser. iii. vol. ix. 296; *Kurz in Journ. As. Soc.* 1876, pt. ii. 310. D. lunata, *Ham.*; *DC. Prodr.* i. 319; *Wall. Cat.* 1243; *Hook. Ic. Pl.* t. 54; *Planch.* l. c. 296; *Miq. Fl. Ind. Bat.* i. pt. ii. p. 120; *H. f. & T. in Journ. Linn. Soc.* ii. 82; *Thwaites Enum.* 22. D. gracilis and D. foliosa, *Hook. f.*; *Planch.* l. c. 297, 298. D. Lobbiana, *Turcz.* (*fide Kurz*).

Throughout INDIA. Var. 1 confined to the Malayan Peninsula; var. 2 ascending to 10,000 ft. in the Himalaya, and 8000 in the Nilghiris.—DISTRIB. Malay Archipelago to Australia.

Stems 3–12 in. high, simple or corymbose upwards. *Racemes* subterminal, pedicels $\frac{1}{3}$–$\frac{2}{3}$ in. long. *Flowers* white. *Seed* as in the preceding species; with a close testa (as Benth. correctly) and not tuberculate, which Planchon says it is. This plant turns very black in drying, but often stains the drying paper purple.

VAR. 1. *typica*; rosulate leaves persistent, sepals very fimbriate. MOULMEIN and SINCAPORE.

VAR. 2. *lunata*; rosulate leaves early deciduous, sepals erose or but slightly fimbriate.

[D. INTERMEDIA of *Herb. Royle* is stated to have been collected in N. W. India; which, as Royle's specimens are *D. peltata typica*, is improbable. *D. intermedia* of *W. & A. Prodr.* 34 is probably founded on the specimen so named and still preserved in Wight's Herbarium which seems to have been collected, not in India, and by a Dr. Haynes, *not* Heyne.]

2. ALDROVANDA, *Linn.*

A weak succulent diaphanous glabrous floating herb in water. *Stems* articulate, with whorls of spathulate-orbicular leaves at the nodes, the laminæ $\frac{1}{6}$–$\frac{1}{4}$ in. diam., contorted, bladdery. *Flowers* peduncled, axillary, solitary. *Calyx* 5-partite. *Petals* 5, hypogynous, connivent in a cap. *Stamens* 5, hypogynous. *Ovary* 1-celled; styles 5 with terminal branching stigmas; ovules numerous, on 5 parietal placentæ. *Capsule* globose, 5-valved. *Seeds* numerous, broad, oblong, testa black shining.

1. **A. vesiculosa,** *Linn.*; *DC. Prodr.* i. 319; *Reich. Iconogr. Europ.* iii. t. 24; *H. f. & T. in Journ. Linn. Soc.* ii. 83; *W. & A. Prodr.* 34; *Planch. in Ann. Sc. Nat.* ser. iii. vol. ix. 304. A. verticillata, *Roxb. Fl. Ind.* ii. 112.

Salt-pans south of CALCUTTA; *Roxburgh*; *T. Thomson*; *S. Kurz.*—DISTRIB. Central Europe and Australia.

ORDER LV. HAMAMELIDEÆ. (By C. B. Clarke, F.L.S.)

Trees or shrubs, often with stellate pubescence; prosenchyma of the wood marked with discs as in the *Coniferæ*. *Leaves* alternate, petiolate, simple or palmately lobed; stipules 1–2, rarely wanting, deciduous or rarely persistent. *Flowers* hermaphrodite or unisexual, collected into heads, spikes, or close racemes, or spikes. *Calyx* small or 0, adnate to the ovary; free in *Distylium*. *Petals* 0, or 4–5 perigynous or nearly epigynous. *Stamens* 4–∞, perigynous, or in *Distylium* hypogynous; anthers dehiscing longitudinally; the valves deciduous in *Loropetalum*. *Ovary* 2-celled; styles 2, separate and ultimately divaricate, persistent (deciduous in *Altingia*); ovules 1–∞, axile, pendulous. *Capsule* woody, dehiscing at the vertex across the dissepiment so as to split each style in two, and in some genera also afterwards imperfectly dehiscing through the dissepiment; endocarp often horny separating from the exocarp. *Seeds* 1, or many when usually only the lowest in each cell is perfect.—DISTRIB. Species 30; found in Asia from Persia and the Himalaya to Malaya China and Japan; in North America and in South Africa.

A. Ovules solitary in each cell.

* *Petals* 0.

Ovary half-inferior. Leaves deciduous. Stamens 5–7 . . .	1. PARROTTIA.
Ovary superior. Flowers separate, not in heads	2. DISTYLIUM.
Ovary half-inferior. Leaves persistent. Stamens 8	3. SYCOPSIS.

** *Petals present.*

Petals obovate-spathulate. Anthers blunt. Leaves deciduous.	4. CORYLOPSIS.
Petals 4, linear. Connective horned. Leaves persistent . .	5. LOROPETALUM.
Petals 5, linear. Calyx-tube circumscissile. Leaves persistent	6. MAINGAYA.

B. Ovules several in each cell.

Male flowers with a perianth. Leaves cordate-ovate, entire .	7. BUCKLANDIA.
Male flowers without a perianth. Leaves oblong-lanceolate, serrate	8. ALTINGIA.

1. **PARROTTIA,** *C. A. Mey.*

Large branching shrubs. *Leaves* alternate, orbicular or oblong, crenate, deciduous; stipules large, early deciduous. *Flowers* hermaphrodite, appearing before the leaves, in capitate heads surrounded by large membranous bracts. *Calyx* half-adherent to the ovary; limb 5–7-fid. *Petals* 0. *Stamens* equal in number and opposite to the calyx-lobes, perigynous; anthers dehiscing by a longitudinal slit. *Ovary* 2-celled; styles 2, soon divaricate, with simple stigmas; ovules solitary in each cell, pendulous. *Capsule* woody; endocarp horny, separating from the exocarp. *Seed* narrowly ellipsoid, testa shining stramineous or scarcely brown.—DISTRIB. Species 2, one in Kashmir, one in Persia.

1. **P. Jacquemontiana,** *Dcne. in Jacq. Voy. Bot.* t. 82; anthers less than $\frac{1}{10}$ in. long subquadrate, ovary and fruit with long woolly pubescence. *H. f. & T. in Journ. Linn. Soc.* ii. 85; *Brandis For. Fl.* p. 216, t. xxviii. Fothergilla involucrata, *Falc. in Proc. Linn. Soc.* i. 18 (*without description*).

KASHMIR, alt. 5000–9000 ft.; common.

A gregarious bush 6–12 ft. high, closely resembling a hazel; twigs and leaves beneath with stellate pubescence. *Leaves* 2–3 in. diam., blunt, petiole $\frac{1}{3}$ in. long. *Flowers* small, involucral bracts obovate $\frac{3}{4}$ in. long. *Calyx*-segments narrow, oblong or linear. *Fruit* in harsh spherical heads 1–1$\frac{1}{2}$ in. diam.

2. **DISTYLIUM,** *Sieb. & Zucc.*

Small trees. *Leaves* alternate, persistent, coriaceous, entire, oblong-lanceolate; stipules lanceolate, early deciduous. *Flowers* small, in short upright axillary spikes, polygamous, not congested. *Calyx* free, deeply 3–5-fid, imbricate; sometimes wanting. *Petals* 0. *Stamens* 2–8, hypogynous; anthers dehiscing by a longitudinal slit. *Ovary* superior, 2-celled; styles 2, soon distant at base, with capitate stigmas; ovule solitary in each cell, attached near the upper inner angle. *Capsule* woody; endocarp horny, separating from the exocarp. *Seed* narrowly ellipsoid, testa shining, stramineous.—DISTRIB. Species 2; one in Khasia, one in China and Japan.

1. **D. indicum,** *Benth. in Herb. Griff.* No. 3377; leaves 3–4 in. more or less stellately pubescent beneath, petiole ⅓ in., unripe fruit ⅝ in. long densely stellate tomentose.

KHASIA MTS.; *Griffith.*

Griffith's specimens are all in half-ripe fruit. *Bark* lenticelled, the end of the twigs and stipules with rusty stellate pubescence. *Spikes* 1–3 in. long, with stellate pubescence, each bearing 2–4 fruits, pedicels ⅓–1 in. long. The *calyx* seems to have been early deciduous. *Styles* very long.—This species appears near the typical *D. racemosum*, Sieb. & Zucc. but has larger leaves not glabrous and much larger fruits; the ripe fruits in *D. racemosum* do not exceed ⅓ in. long. *D. racemosum* is a tree 25 ft. high.

3. SYCOPSIS, *Oliv.*

A tree (or shrub). *Leaves* alternate, petioled, entire, coriaceous, lanceolate; stipules minute, early deciduous. *Flowers* unisexual, in small close axillary spikes, both sexes in the same spike. MALE: calyx very small; petals 0; stamens 8 (of which number several appear abortive); rudimentary ovary 2-fid. FEMALE: calyx-tube adnate to the ovary for ¾ its height; petals 0; ovary 2-celled; styles 2 separate; ovules solitary in each cell pendulous.

1. **S. Griffithiana,** *Oliv. in Trans. Linn. Soc.* xxiii. 83 *with a figure*; *Benth. & H. f. Gen. Pl.* i. 666.

KHASIA MTS.; *Griffith.*

Boughs much branched with lenticular bark. *Leaves* 2–3 in. with stellate pubescence when young but soon glabrous; petiole ¼ in. long. *Spikes* less than 1 in. stellately pubescent (and with sheathing bracts *Benth. & H. f.*). Young *fruits* ⅓ in. diam., white-tomentose with close matted stellate hairs. *Anthers* dehiscent longitudinally.—Specimens imperfect.

4. CORYLOPSIS, *Sieb. & Zucc.*

Shrubs in habit leaves and inflorescence resembling hazels. *Leaves* alternate, petioled, ovate or oblong, serrate, deciduous; stipules large, deciduous. *Flowers* appearing before the leaves in pendulous racemes, each flower nearly sessile with a large sheathing bract. *Calyx*-tube adnate to the ovary, limb of 5 valvate lobes. *Petals* 5, perigynous, obovate-spathulate. *Stamens* 5, perigynous; anthers separated by a somewhat broad connective, dehiscing longitudinally laterally. *Scales* 5, alternate with the stamens, or 10–15 irregularly placed. *Ovary* half-inferior, 2-celled; styles two, soon divaricate; ovules 1 in each cell, pendulous. *Capsule* woody, endocarp horny, separating from the exocarp. *Seeds* narrowly ellipsoid, testa black shining.—DISTRIB. Species 4, extending from East Bengal through China to Japan.

1. **C. Himalayana,** *Griff. in Journ. Asiat. Soc. Bengal,* xxiii. 642, *with a figure wherein the name is changed to C. grata*; twigs petioles and peduncles stellate-tomentose or pubescent, bracts and calyces silky, racemes dense in fruit. *H. f. & T. in Journ. Linn. Soc.* ii. 85. Hamamelida, *Griff. Ic. Pl. Asiat.* t. 633 (*excellent*).

KHASIA MTS., alt. 4000—6000 ft., common. BHOTAN, alt. 5000—8000 ft.; *Griffith.*

About 6 ft. high; bark lenticelled. *Leaves* 4 in., round-ovate and acute, or smaller and narrower, often cordate at base with a petiole $\frac{1}{4}$–$1\frac{1}{2}$ in., plicate, glabrous above, pilose silky or tomentose beneath; nerves straight, parallel, prominent. *Petals* obovate or elliptic, unguiculate, yellow-white.—*C. multiflora*, Hance, from the tea districts of Fokien, hardly differs except that the nerves of the leaves are much fewer and wider apart, and that the petals have a very long claw and round limb.

5. LOROPETALUM, *Br.*

A much branching woody shrub. *Leaves* alternate, oblong, entire, persistent; stipules membranous, soon deciduous. *Flower*-heads peduncled, quasi-terminal, ebracteate, of 6–8 sessile *flowers*. *Calyx*-tube adnate to the ovary, limb of 4 valvate lobes. *Petals* 4, perigynous, linear, circinate in æstivation. *Stamens* 4, perigynous, filaments very short, connective produced as a horn. Hypogynous *scales* 4, very small. *Ovary* half-inferior, 2-celled; styles 2, distinct, soon divergent; ovules in each cell 1, pendulous. *Capsule* woody, ovoid, endocarp horny, separating from the exocarp. *Seeds* narrowly ellipsoid, testa black shining.

L. chinense, *Oliv. in Trans. Linn. Soc.* xxiii. 459. Hamamelis chinensis, *Br. in Abel China*, 375, *with a figure*; *suggesting the new genus Loropetalum. DC. Prodr.* iv. 269; *H. f. & T. in Journ. Linn. Soc.* ii. 85.

KHASIA MTS. alt. 4000–5000 ft.; *J. D. H. & T. Thomson.*—DISTRIB. South China.

Twigs and inflorescence with much stellate pubescence. *Leaves* 1–$2\frac{1}{2}$ in. long, stellate-hairy on both surfaces (small in the Chinese specimens), acute, from a rounded base; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. long. *Petals* $\frac{1}{2}$–$\frac{5}{8}$ in. long, 4 or 5 times the sepals, yellowish. *Anthers* short, the edges of the valves bent in to meet the connective, so that the young stamen has 4 pseudo-cells; the valves open from the connective and soon after drop off altogether.

6. MAINGAYA, *Oliver.*

A tree. *Leaves* alternate, undivided, petioled, persistent; stipules small, deciduous. *Heads* peduncled, quasi-terminal, ebracteate, of about 15 flowers. *Calyx-tube* adherent to the ovary; the limb closed, splitting up on one side a little way from the base and then circumscissile deciduous in a cap. *Petals* 5, perigynous, linear, circinate in æstivation. *Stamens* 5, perigynous, filaments very short, connective produced as a horn. *Scales* about 10, very small. *Ovary* half-inferior, 2-celled; styles 2 distinct, short; ovule 1 in each cell, pendulous. *Capsule* woody, ovoid, endocarp horny, separating from the exocarp. *Seeds* unknown.

1. **M. malayana,** *Oliv. in Trans. Linn. Soc.* xxviii. 517, t. 44.

PENANG; *Maingay*, No. 1871.

A tall tree with rather small stem (ex Maingay), glabrous, the innovations peduncles and calyx with stellate hairs. *Leaves* 3–5 in. long, oblong-lanceolate, petiole $\frac{1}{2}$–$\frac{3}{4}$ in. long glabrous. *Petals* $\frac{1}{2}$–$\frac{5}{8}$ in. long, 4–6 times the sepals. Dehiscing *capsule* $\frac{1}{2}$ in. long and $\frac{1}{2}$ in. broad.—*Maingaya* differs from *Loropetalum* in the 5 not 4 petals, in the habit, but particularly in the calyx-limb circumscissile falling off in a cap before the flower expands.

7. BUCKLANDIA, *Br.*

A tree attaining 80 ft. high. *Leaves* alternate, cordate-ovate, acuminate, entire, long-petioled; stipules solitary or in pairs, large, oblong, coriaceous, deciduous. *Inflorescence* of 2–5-peduncled heads, at first enclosed between a pair of stipules; flowers adnate by their calyces, about 8 in a head, polygamous. *Calyx-tube* adnate to the ovary; limb 5-lobed. *Petals* in the ⚥ flower linear-spathulate, fleshy, variable in number; in the ♀ rudimentary. *Stamens* 10–14 (in the ♀ r one); filaments long. *Ovary* half-inferior, 2-celled; styles 2, separate, soon divaricate; ovules in each cell 6 in two rows. *Capsule* nearly superior, woody, subglobose, endocarp horny, showing a tendency to separate from the exocarp. *Seeds* in each cell 6, oblong, trigonous; the upper wingless solid, without any embryo, the lower one in each cell winged fertile.

1. **B. populnea,** *Br. in Wall. Cat.* 7414; *Griff. in Asiat. Res.* xix. 95, *with two plates.* B. populifolia, *H. f. & T. in Journ. Linn. Soc.* ii. 86; *Kurz Forest Fl. Brit. Burma,* i. 445. Liquidambar tricuspis, *Miq. Fl. Ind. Bat.* i. pt. i. 1097 and *Suppl.* 346, *with a figure.*

Temperate Himalaya, from Nepal to Bhotan, alt. 5000–8000 ft., common. Khasia Mts., alt. 4000–6000 ft., common. Burmah, *Griffith, Kurz.*—Distrib. Java, Sumatra.

Branches and adult leaves glabrous. *Leaves* 3–8 in. with a cartilaginous edge, quite entire or 3-cuspidate especially in young plants, petiole 1–5 in. glabrous or when young densely silky with brown hairs. *Peduncles* (at least at first) densely brown silky; as are the young ovaries.—The Malayan *Liquidambar tricuspis* does not differ in the smallest point from Himalayan specimens some of which have tri-cuspidate leaves and sericeous petioles. Cf. *Kurz in Flora,* 1871, p. 289.

8. ALTINGIA, *Noronha.*

Trees. *Leaves* alternate, petioled, ovate or oblong, glandular-serrate, persistent; stipules deciduous or persistent. *Flowers* in dense heads; heads wrapped by a large bract, males racemose, females solitary. Male heads a mass of stamens with very short filaments, probably representing numerous achlamydeous flowers. *Anthers* obverse-pyramidal, the valves when young turned in till they reach the connective so that the young stamen is pseudo-4-celled; dehiscing longitudinally. Female heads of 12–20 flowers; calyces confluent, without limb. *Petals* 0 (some rudimentary stamens have been taken for petals). *Ovary* ½-inferior, 2-celled; styles 2, separate, deciduous; ovules numerous, axile. *Fruit*-head globose, harsh. *Seeds* numerous; lowest 1–2 of each cell winged fertile, the upper without wing or embryo.—Distrib. Species 2; extending from East Bengal to China and Malaya.

1. **A. excelsa,** *Noronha in Verh. Bat. Genootsch* v. 41, *ex Benth. & Hook. f. Gen. Pl.* i. pt. ii. 669; leaves elliptic-lanceolate acuminate, petiole 1–1½ in. *Kurz Forest Fl. Brit. Burma,* i. 446. Sedgwickia cerasifolia, *Griff. in Asiat. Res.* xix. 99, *with two plates.* Liquidambar Altingia, *Blume Fl. Jav.* fasc. xvii. 8, *with a figure*; *H. f. & T. in Journ. Linn. Soc.* ii. 86; *Miq. Fl. Ind. Bat.* i. pt. i. 836. L. Altingiana, *Blume Bijd.* 527.

ASSAM and BHOTAN; *Griffith.* PEGU and MERGUI, *Kurz.*—DISTRIB. Java, Yunan.
A tree 60–100 ft. high. *Leaves* 3–4½ in., glabrous on both surfaces, or with tufts of hairs in the axils of the nerves beneath.—The only other species, *A. chinensis*, differs in its thicker leaves, less acuminate, and much more shortly petioled.

ORDER LVI. HALORAGEÆ. (By C. B. Clarke, F.L.S.)

Herbs, either weak aquatics or small land plants. *Leaves* opposite or whorled (or in the Indian species occasionally partly alternate) when submersed often pectinately pinnatifid; stipules 0. *Flowers* axillary, solitary or clustered, sessile less often pedicelled, the whorls often simulating a spike; hermaphrodite or unisexual, always small. *Calyx-lobes* 4 or 0. *Petals* 4 epigynous or 0. *Stamens* 8, 4, or 1 epigynous in the hermaph. flowers. *Ovary* inferior, 4-, 2- or 1-celled; styles 4, 2 or 1, fimbriate or simple; ovules 4, pendulous (or in *Hippuris* 1). *Fruit* small dry or drupaceous, 4–2–1-celled, indehiscent or separating into its carpels; seeds 4 or more rarely 1.—DISTRIB. Species 80, many aquatic; spread over the whole globe.

Terrestrial. Flowers all sessile or subsessile. Stamens 8 . .	1. HALORAGIS.
Terrestrial. Male flowers pedicelled. Stamens 8	2. SERPICULA.
Aquatic. Stamen 1. Style 1. Ovule 1	3. HIPPURIS.
Aquatic. Stamens 8 or 4. Styles 4. Seeds 4	4. MYRIOPHYLLUM.
Aquatic or subaquatic. Stamen 1. Styles 2. Seeds 4 . .	5. CALLITRICHE.

1. HALORAGIS, *Forst.*

Branching wiry herbs. *Leaves* opposite, the upper sometimes alternate, toothed, rigid. *Flowers* minute, nearly sessile in the axil of bracts, spicate or racemose, partially unisexual or hermaphrodite. *Calyx-tube* 4–8-ribbed; lobes 4 erect persistent acute valvate. *Petals* 4 coriaceous, often wanting in the ♀. *Stamens* 8 epigynous. *Ovary* 2- or 4-celled with 4 pendulous ovules; stigmas 4 (in the females at least) sessile, feathery. *Fruit* a dry 2–4-celled 2–4-seeded nut; but in the two Indian species by abortion 1-celled 1-seeded.—DISTRIB. Species 40; reaching from Japan and East Bengal to New Zealand; Australia being the centre of the genus; one species found in Juan Fernandez.

1. **H. micrantha,** *Br. in Flinders Voy.* ii. 550; glabrous, leaves ovate acute denticulate, flowers in terminal often subpaniculate racemes. *Benth. Fl. Austral.* ii. 482. H. tenella, *Brongn. in Duperr. Voy.* t. 68. Gonocarpus micranthus, *Thunb. Fl. Jap.* t. 15; *DC. Prodr.* iii. 66. Goniocarpus micranthus, *Koen. & Sims Ann. Bot.* i. 546, t. 12.

KHASIA MTS., alt. 5000–7000 ft., *Griffith, J. D. H. & T. Thomson.* SIKKIM, alt. 8000–10,000 ft., *J. D. H.*—DISTRIB. From Sikkim and Japan across China Malaya and Australia to New Zealand.
A wiry branching herb, stems 4–16 in. *Leaves* ¼ in., opposite, very shortly petioled; upper sometimes alternate passing by degrees into the lower bracts. *Flowers* very small; pedicels about $\frac{1}{16}$ in. *Petals* thrice the triangular sepals. *Fruit* about $\frac{1}{20}$ in. long, shining, glabrous with 8 ribs, 1-celled, 1-seeded.

2. **H. tetragyna,** *Hook. f. Fl. New Zealand,* i. 62; harshly though often minutely scabrous, leaves lanceolate (ovate in the New Zealand form) serrate, flowers in terminal often subpaniculate spikes. H. scabra, *Benth. Fl. Hongk.*

139. Goniocarpus scaber, *Koen. & Sims Ann. Bot.* i. 547, t. 12; *DC. Prodr.* iii. 66. G. tetragyna, *Labill. Fl. Nov. Holl.* i. t. 53.

KHASIA MTS., alt. 5000–6000 ft.; between Nunklow and Myrung, and at Kullong; *J. D. H. & T. Thomson.*—DISTRIB. China, Malaya, Australia, New Zealand.

A suberect rigid herb 4–10 in. high with many branches. *Leaves* ¾ in. in the Khasia examples oblong acute, as in the Chinese; in the New Zealand much shorter often ovate; opposite, the upper sometimes alternate, passing by degrees into the bracts. *Flowers* sessile, very small. *Sepals* triangular with a cartilaginous recurved border. *Petals* twice the sepals, scabrous-pilose on their backs. *Fruit* with 8 (often obscure) ribs, tubercular, scabrous and covered also with most minute white points, 1-celled, 1-seeded.—The Australian specimens agree with those of Bengal in these minute points; and moreover the fruit appears in the Australian specimens uniformly 1-seeded (as stated correctly by Kœnig for the Chinese plant) and not 4-seeded (as stated and figured by La Billardière).

2. SERPICULA, *Linn.*

Herbs, small, decumbent, branching. *Leaves* opposite or alternate (often on the same plant). *Flowers* monœcious, minute, clustered in the same axils, the females sessile the males pedicelled. MALE: calyx-tube short, lobes 4 ovate acute; petals 4, cucullate; stamens 8; stigmas 4, rudimentary. FEMALE: calyx-tube long, lobes 4 ovate acute; petals and stamens 0; ovary 1-celled; styles 4 spreading with papillose or plumose stigmas; ovules 4, pendulous. *Nut* minute, ovate, 1-seeded, 8-ribbed or smooth.—DISTRIB. Species 2–4 in the marshes of warm Asia, Africa, and America.

1. **S. zeylanica,** *Arn. in Herb.*; suffruticose, leaves linear or linear obovate entire or with 1–3 linear small teeth on each edge, fruit glabrous 8-ribbed tuberculate on the ribs. S. indica, *Thwaites partim,* viz. C.P. No. 447, 146. Haloragis oligantha, *Arn. Pugillus Pl. Ind. Or.* 18, *not of W. & A. Prodr.*

CEYLON; Adams Peak, *Thwaites.*

Glabrous. *Stems* 6–16 in. *Leaves* ¼–¾ in. opposite and alternate on the same stem, densely approximated. *Pedicels* of the male fl. equalling the leaves. *Stamens* 8. *Fruit* most minutely puncticulate between the ribs not pilose.

VAR. *minor*; stems very delicate scarcely 2 in. S. indica *Thwaites β.* minor No. 146 partly. Ceylon, Central Provinces; *Thwaites.* Appears worthy of specific distinction, but Mr. Thwaites treats it as a variety.

2. **S. indica,** *Thwaites Enum.* p. 123 *partly*; leaves obovate-oblong or obovate dentate-serrate, fruit with minute glands and very small white hairs, ribs very obscure or generally altogether wanting. S. brevipes *and* S. hirsuta, *W. & A. Prodr.* 338. S. hirsuta, *Wight. Ic.* 1001; *Arn. Pugillus Pl. Ind. Or.* 18. Serpicula sp., *Wall. Cat.* 7488.

CEYLON and MTS. of the DECCAN PENINSULA, alt. 6000–8000 ft., frequent. MYSORE, *T. Lobb.*

Pilose, or sometimes glabrous except the ovary and calyx. *Leaves* ¼–½ in. usually minutely ciliate on the edges, opposite with the upper ones alternate, or with some lower leaves alternate also; or all opposite. *Pedicels* of the male flowers usually as long as the leaves, often much longer. *Stamens* 8. *Fruit* generally very free from ridges or tubercles.

S. veronicæfolia, Bory of Java; Tulasne in Ann. Sc. Nat. ser. 4. vi. 126, slightly differs from the most glabrous Indian specimens (*S. brevipes W. & A.*) by being quite glabrous, more robust in habit, a brighter red colour, and the fruit more tuberculate.

SERPICULA VERTICILLATA, *Roxb. Cor. Pl.* t. 164 and *Fl. Ind.* iii. 578 is Hydrilla verticillata *Richard* among the *Vallisnerieæ*.

3. HIPPURIS, *Linn.*

A glabrous water plant, the stems thick, simple, leafy. *Leaves* in whorls of 4–6–12, linear or oblong. *Flowers* minute, solitary, sessile in the axils of the leaves; hermaphrodite or unisexual. *Calyx*-tube subcylindric, limb entire. *Petals* 0. *Stamen* 1, epigynous. *Ovary* inferior, 1-celled; style 1, linear, stigmatose along nearly its whole length; ovule 1, pendulous. *Drupe* ellipsoid, very smooth, indehiscent, with a thick wall.

1. **H. vulgaris,** *Linn. Sp. Pl.* p. 6; *DC. Prodr.* iii. 71; *Engl. Bot.* t. 763; *Boiss. Fl. Orient.* ii. 754.

WEST TIBET, alt. 10,000–15,000 ft.; *Falconer, T. Thomson, Strachey & Winterbottom.*—DISTRIB. Cabul; Dahuria; and in the frigid or cool temperate waters of the whole Northern Hemisphere; also at Magellan Straits.

Leaves in the Tibet specimens about 1 in. 6–10 in the whorl. *Flowers* in the upper part of the stem that emerges from the water; lowest part of the stem losing its leaves.—In all respects agreeing with the common European type.

4. MYRIOPHYLLUM, *Linn.*

Herbs, glabrous, their stems floating. *Leaves* dentate-serrate or pectinate-pinnatifid, rarely entire, whorled in the Indian species except *M. intermedium*. *Flowers* small, sessile or nearly so, in the axils of floral leaves or in nearly naked spikes; monœcious or hermaphrodite. MALE: calyx-tube short, limb 2–4-fid or 0; petals 2–4; stamens 2–8. FEMALE: calyx-tube deeply 4-furrowed, limb 0 or of 4 minute lobes; petals minute or 0; ovary inferior, 4- or 2-celled; styles 2 or 4, short, usually recurved with plumose stigmas; ovules solitary in each cell, pendulous. *Fruit* 4-furrowed or separating into 4 or 2 carpels.—DISTRIB. Species 15, found all over the world.

Wight's Herb. No. 942 named *M. indicum Willd.* consisted really of *M. intermedium DC.* and *M. tuberculatum Roxb.* mixed together. The single plate we have illustrating Indian *Myriophyllum* viz. *Wight Ill.* t. 102 is made up of a stem of *M. intermedium* together with an analysis of the fruit (very good) of *M. tuberculatum*.

Further, the plate of *Haloragis oligantha Wight Ic.* t. 1061 is *M. intermedium DC.*, as are Wight's own herbarium specimens of his *Haloragis oligantha*; but not so Arnott's, as see under *Serpicula zeylanica* above.

Lastly, though Wight's Herb. 942 was named *M. indicum, Willd.*, Wight's own Herb. No. 1094 is truly *M. indicum* as Arnott quotes it to be in *W. & A. Prodr.* 339.

1. **M. tuberculatum,** *Roxb. Hort. Beng.* 12; *Fl. Ind.* i. 451; spikes in fruit subterminal, floral leaves $\frac{1}{4}$–$\frac{3}{4}$ in. linear cuneate toothed upwards, fruit $\frac{1}{8}$ in. long, a broad furrow between the acute carpel-backs, both the ridges and the broad furrows carrying pointed small tubercles. *Wall. Cat.* 6337; *DC. Prodr.* iii. 69; *Miq. Fl. Ind. Bat.* i. pt. i. 635. M. intermedium, *Wight Ill.* t. 102 *as to the fruit only*. M. indicum, *Griff. Not.* iv. 687.

ASSAM and EAST BENGAL. Very common in the jheels, but no specimen from west of Calcutta.

Upper whorls usually of male flowers, lower of female; hermaphrodite flowers

also occur. *Stamens* always 4, but the number is probably not constant. *Stigmas* pink, much fimbriate. *Fruit* looked down upon appears stellate.

2. **M. indicum,** *Willd. Sp. Pl.* iv. 407; spikes in fruit subterminal, floral leaves $\frac{1}{4}$–$\frac{1}{2}$ in. narrow-lanceolate or linear-lanceolate, upper entire or crenate, fruit scarce $\frac{1}{16}$ in. long but much broader, carpels 4 rounded on the back but separated by wide furrows tubercled and puberulous or finally quite smooth and glabrous. *Wall. Cat.* 6338; *DC. Prodr.* iii. 68; *W. & A. Prodr.* 339; *Miq. Fl. Ind. Bat.* i. pt. i. 634. M. tetrandrum, *Roxb. Fl. Ind.* i. 451; *Griff. Notul.* iv. 686; *W. & A. Prodr.* 339; *Miq. l. c.* 634. [M. indicum, *Wight Ill.* t. 102 *to be altogether excluded.*]

ASSAM and BENGAL, in the jheels and canals, common, COROMANDEL coast and CEYLON.

Upper whorls of male flowers, lower of female, intermediate often hermaphrodite. *Stamens* 4. *Stigmas* green, little fimbriate. *Fruit* looked down upon appears stellate.

There is a variety with longer floral leaves, so that the inflorescence is hardly terminal, and with the leaves not quite opposite; but the fruit noway approaches that of *M. intermedium.*

3. **M. verticillatum,** *Linn.*; *Boiss. Fl. Orient.* ii. 755; whorls of fruit axillary, floral leaves $\frac{1}{2}$–$1\frac{1}{2}$ in. pectinate, segments linear, fruit about as long as broad not deeply furrowed or tuberculate. *DC. Prodr.* iii. 68; *Engl. Bot.* t. 218; *not Roxb. Hort. Beng.* 12.

KASHMIR, *Falconer, Jacquemont, Thomson* (all barren). Ponds above Shapiyon, alt. 7000 ft.; *C. B. Clarke.*—DISTRIB. Persia, Dahuria, North Asia, Europe, North America.

Fruit subquadrate, backs of the carpels rounded, furrows between them broad but shallow.

4. **M. spicatum,** *Linn.*; *DC. Prodr.* iii. 68; spikes always terminal, bracts oblong entire shorter than the expanded petals, fruit $\frac{1}{8}$ in. ovoid, backs of the carpels broad flattened furrows very narrow soon becoming deep, carpels more or less tubercled on the back. *Engl. Bot.* t. 83; *Gaertn. Fruct.* t. 68; *Fl. Dan.* iv. t. 681; *Boiss. Fl. Orient.* ii. 755.

KASHMIR, alt. 5000 ft. descending to 1000 ft. along the northern boundary of the Punjab; frequent. KUMAON, alt. 5000 ft.—DISTRIB. Cabul, cold and temperate Northern Hemisphere.

Fruit ovoid, seen from above appears round, the valleys between the carpels being too narrow to be noticed till closely examined. The fruit of the Indian examples is rather larger than that of the European, the backs of the carpels being very flat somewhat corky and thickened; called *M. spicatum Linn.* var. *muricatum* by Maximowicz (*Diagn. Pl.* xv. 183) who quotes correctly *Griff.* No. 2442 (Kew Distrib.).

5. **M. intermedium,** *DC. Prodr.* iii. 69; fruit axillary, floral leaves $\frac{1}{2}$–1 in. long alternate solitary or 2–3-nate linear and entire to lanceolate and incise-serrate, fruit very small hardly $\frac{1}{16}$ in. long but less broad, carpels rounded and most minutely scabrous on their backs, furrows shallow. *Miq. Fl. Ind. Bat.* i. pt. i. 634. M. indicum, *Wight Ill.* t. 102, *the plant only, not the fruit.* M. variæfolium, *Hook. Ic. Pl.* t. 289. M. lineare, *Heyne in Herb. Rottl.* Halorgis oligantha, *W. & A. Prodr.* 338; *Wight Ic.* 1061 *not of Arn.*

NILGHIRI MTS., alt. 7000 ft.; *Hohenacker* No. 1563, *Gardner, Schmidt, Wight.* Cuttalam, DECCAN PENINSULA, *Rottler.* Mayaburam, *Sir T. Adam.*—DISTRIB. Malaya, Australia, New Zealand, South America.

Leaves in the Indian examples sometimes whorled, more commonly in tufts of 1–3, each tuft placed irregularly round the stem. The Australian *M. variæfolium* has the leaves usually whorled; but the whorls get broken and the Australian examples become thus exactly like the Indian; the fruit is altogether the same.—The correct name of this plant is open to much question. De Candolle's is the oldest, but the accompanying description was drawn up to fit *Hottonia sessiliflora, Vahl Symb.* ii. 36 which probably was something altogether different; then a *Myriophyllum* is discovered in India which De Candolle's description very fairly fits, and Hohenacker and others apply it to the Candollean name.

5. **CALLITRICHE,** *Linn.*

Glabrous slender annual herbs growing in moist places, or their branches floating or submerged. *Leaves* opposite, linear- or obovate-spathulate, entire, the upper ones often rosulate. *Flowers* minute, axillary, unisexual, usually monœcious, solitary, or sometimes one male and one female in the same axil simulating a hermaphrodite flower; achlamydeous; bracteoles white, membranous, linear-oblong, very caducous. MALE: stamen 1. FEMALE: ovary 4-ridged 4-celled; styles 2, elongate, stigmatose their whole length; ovules solitary in each cell, pendulous. *Fruit* coriaceous, indehiscent, 4-seeded, the 4 carpels at length separating.—DISTRIB. Species 1 or 2 found almost all over the globe; but some authors allow 10 or 20 species.

[The distribution of such critical species as these *Callitriches* cannot be safely stated; there are examples collected in Sikkim, alt. 8000–9000 ft., by Sir J. D. Hooker which are probably *C. verna* (and not *C. stagnalis*), but they show no fruit.]

1. **C. stagnalis,** *Scop. Fl. Carniol.* ii. 251; leaves obovate-spathulate, styles subpersistent, fruit suborbicular the edges acute keeled but hardly winged. *Koch Syn. Fl. Germ.* 212; *Hegelm. Monogr. Callitrich.* 58. C. Wightiana, *Wall. Cat.* 7008; *W. & A. Prodr.* 339; *Wight Ic.* 1947; *Miq. Fl. Ind. Bat.* i. pt. i. 635.

Indian mountains from the HIMALAYA, alt. 5000–10,000 ft., to the DECCAN, alt. 7000 ft. Ceylon, alt. 5000 ft., *Thwaites.*—DISTRIB. Europe. North Asia, Tropical Africa, Malaya, Australia and New Zealand.

2. **C. verna,** *Linn.*; *Koch Syn. Fl. Germ.* 212; leaves oblong-spathulate, fruit longer than broad the edges not keeled. *Hegelm. Monogr. Callitrich.* 55.

TEMPERATE WESTERN HIMALAYA, alt. 5000–8000 ft., *Edgeworth*; KASHMIR, alt. 7000 ft., *C. B. Clarke.*—DISTRIB. Europe. Cold and temperate Asia and North America.

ORDER LVII. **RHIZOPHOREÆ.** (By the Rev. G. Henslow, F.L.S.)

Trees or shrubs. *Leaves* opposite, stipulate (except *Anisophyllea*), usually coriaceous, glabrous; stipules interpetiolar, very caducous. *Flowers* axillary, usually bisexual, surrounded at the base with connate or cupuliform bracts or ebracteate. *Calyx* more or less adnate to the ovary (except *Blepharistemma*); limb produced beyond the ovary, 4–14-lobed; lobes valvate, persistent. *Petals* equal in number to the sepals, entire emarginate 2-fid or lacerate. *Stamens* usually twice the number of petals, in pairs opposite to and embraced by them, rarely indefinite (*Kandelia*); anthers 2-celled, rarely multi-locellate (*Rhizophora*). *Ovary* from 5- to 1-celled by solution of the septa; styles connate (except in

Anisophyllea); ovules usually 2 in each cell, pendulous. *Fruit* coriaceous, mostly indehiscent, 1-celled, 1-seeded. *Seed* pendulous, arillate or not; albumen fleshy or 0; embryo inverted, small if surrounded by albumen, elongated if exalbuminous; radicle macropodous in the tribe *Rhizophoreæ*, perforating the apex of the pericarp and germinating while the fruit still adheres to the tree.—Distrib. Tropical plants; many sharing with an arboreal vegetation the muddy shores of the estuaries of rivers. Genera 17, species about 50.

Tribe I. **Rhizophoreæ.** *Leaves* opposite, stipulate. *Ovary* inferior; style single. *Embryo* exalbuminous, macropodous, germinating while the fruit is still on the tree.

Petals 4, entire. Stamens 8. Ovary 2-celled . . . . . 1. Rhizophora.
Petals 5–6, emarginate. Stamens 10–12. Ovary 3-celled . 2. Ceriops.
Petals 5–6, lacerate. Stamens ∞. Ovary 1-celled . . . 3. Kandelia.
Petals 8–14, 2-fid. Stamens 16–28. Ovary 2–4-celled . . 4. Bruguiera.

Tribe II. **Legnotideæ.** *Leaves* opposite, stipulate. *Ovary* half-inferior or superior but adnate to the base of the calyx; style single. *Embryo* immersed in fleshy albumen.

Calyx-tube minutely bracteolate, half-superior, lobes erect . 5. Carallia.
Calyx-tube ebracteolate, half-superior, lobes reflexed . . . 6. Pellacalyx.
Calyx-tube ebracteolate, adnate to the base of the ovary; cells of the ovary 4-ovuled . . . . 7. Gynotroches.
Calyx-tube with connate bracteoles, adnate to the base of the ovary, lobes patent; cells of the ovary 2-ovuled . . . . 8. Weihea.
Calyx-tube ebracteolate, adnate to the base of the ovary, lobes erect . . . . 9. Blepharistemma.

Tribe III. **Anisophylleæ.** *Leaves* alternate, exstipulate. *Ovary* inferior; styles 4. *Embryo* exalbuminous.

Characters of the tribe . . . . 10. Anisophyllea.

1. RHIZOPHORA, *Linn.*

Trees. *Branches* marked by leaf-scars. *Leaves* ovate or elliptic, mucronate. *Flowers* rather large, on axillary 2–3-chotomously divided and few-flowered cymes. *Calyx* 4-lobed, surrounded at the base by connate bracteoles. *Petals* 4, entire, inserted on a fleshy disk. *Anthers* subsessile, multi-locellate. *Ovary* 2-celled, half-inferior, projecting beyond the calyx as a fleshy cone; cells 2-ovuled; stigma bifid. *Fruit* coriaceous, ovoid or obconic, crowned with the reflexed limb of the calyx. *Radicle* elongated, clavate, perforating the apex of the fruit and descending from the tree into the mud.—Distrib. About 5 species; frequent on muddy tropical shores.

1. **R. mucronata,** *Lam. Dict.* iv. 169; *Ill.* t. 396, f. 2; peduncles arising from the axils of leaves of the same year longer than the petioles about 3-flowered, flowers pedicellate. *Bedd. Fl. Sylv. Anal. Gen.* t. xiii. fig. 4; *Dalz. & Gibs. Bomb. Fl.* 95; *Wight Ill.* i. 209; *Ic.* t. 238; *Kurz For. Fl. Brit. Burm.* i. 447. R. macrorrhiza, *Griff. in Trans. Med. Phys. Soc. Calc.* viii. 2. R. candelaria, *W. & A. Prodr.* i. 310; *Wall. Cat.* 4878. R. Mangle, *Linn.*: *Roxb. Fl. Ind.* ii. 459.—*Rheede Hort. Mal.* vi. t. 34.

Tidal shores from the mouths of the Indus to Malacca and Ceylon.—DISTRIB. Tropical shores of Asia, Africa and Australia.

A large shrub or tree, evergreen. *Leaves* 3–7 by 1½–4 in., narrowed at the base. *Flowers* more or less drooping. *Calyx-lobes* triangular, narrowing upwards. *Petals* villous, shorter than the calyx-limb, subconnivent, coriaceous; margins involute.—A variety in Malacca, R. stylosa, *Griff.* (sp.) *Notul.* iv. 666; and *Ic. Pl. Asiat.* t. 640, differs according to Griffith from *R. conjugata* in its smaller stature, length of style, smaller radicle, more villous petals and more elongated base of the flowers, but the description shows a closer agreement with *R. mucronata* than with *R. conjugata*.

2. **R. conjugata,** *Linn.*; *DC. Prodr.* iii. 33; peduncles arising from the axils of (fallen) leaves of the previous year shorter than the petioles mostly 2-flowered, flowers sessile. R. candelaria, *DC.* l. c. 32. R. apiculata, *Blume Flor. Jav.* i. 91, *and Mus. Bot.* 134; *Wight Ill.* i. 209, t. 3; *Kurz For. Fl. Brit. Burm.* i. 447.

Tidal marshes from the mouths of the Indus to Malacca and Ceylon.—DISTRIB. Tropical shores of Asia and Africa.

Shrubby or arborescent. *Leaves* 4–8 by 1–3½ in., usually more lanceolate than in the preceding species and subacuminate. *Calyx-lobes* ovate. *Petals* glabrous, linear, flat, submembranous. *Stamens* 11–12.

2. CERIOPS, *Arn.*

Trees. *Leaves* ovate or obovate. *Peduncles* axillary with subcapitate flowers. *Calyx* 5–6-merous, surrounded at the base with connate bracts. *Petals* 5–6, inserted at the base of a 10–12-lobed fleshy disk, emarginate, appendiculate; lobes of the petals with clavate or capitate bristles. *Stamens* 10–12, filaments inserted between the lobes of the disk slender; anthers 2-celled. *Ovary* 3-celled (at least above), cells 2-ovuled; style short, stigma simple. *Fruit* coriaceous, ovoid, surrounded by the reflexed limb of the calyx, 1-celled, 1-seeded. *Germination* as in Rhizophora.—DISTRIB. Species 2 or 3, natives of the tropical shores of the Old World.

1. **C. Candolleana,** *Arn. in Ann. Nat. Hist.* i. 363; calyx 5-cleft, lobes linear acute, petals 5 glabrous emarginate tip with 3–4 capitate bristles. *Blume Mus. Bot.* 142; *Wight Ill.* i. 209; *Ic.* t. 240; *Bedd. Flor. Sylv. Anal. Gen.* t. xiii. fig. 5; *Miq. Fl. Ind. Bat.* i. 590; *Brandis For. Fl.* 218; *Kurz, For. Fl. Brit. Burm.* i. 448. R. timorensis, *DC. Prodr.* iii. 32.

Tidal forests, &c., from the mouths of the Indus to Malacca and Ceylon.—DISTRIB. of the genus.

A small shrub or small tree. *Leaves* 2–3 by 1–2 in., obovate, very obtuse, cuneate or attenuate at the base. *Flowers* in rather loose cymes or subcapitate. *Stamens* 10, alternately shorter. *Ovary* half-inferior, 3-celled. *Fruit* small, club-shaped or subovate, surrounded near the base by the reflexed segments of the calyx.

2. **C. Roxburghiana,** *Arn. in Ann. Nat. Hist.* i. 363; calyx 5–6-cleft, lobes subovate subobtuse, petals concave glabrous below setoso-ciliate above towards the apex. *Miq. Fl. Ind. Bat.* i. 591; *Kurz For. Fl. Brit. Burm.* i. 448. Rhizophora decandra, *Roxb. Hort. Beng.* 36; *Wall. Cat.* 4875.

Tidal forests from the Sunderbunds to Malacca.—DISTRIB. of the genus.

A dwarf tree or shrub. *Leaves* 1–4 by ⅔ to 2 in., narrowed at the base, very obtuse, reddish brown beneath, glabrous. *Inflorescence* of small axillary cymes or glomerules. *Peduncle* very short. *Stamens* 10–12.

3. **KANDELIA,** *Wight & Arn.*

A small tree. *Leaves* oblong, obtuse. *Peduncles* axillary, dichotomously branched, few-flowered. *Flowers* rather large, white. *Calyx* 5–6-merous, surrounded at the base by connate bracteoles, adnate to the base of the ovary; lobes linear, valvate. *Petals* 2-fid; lobes multifid, segments capillary. *Stamens* indefinite, filaments slender exserted. *Ovary* 1-celled, prolonged above the calyx into a fleshy cone; stigma 3-lobed; ovules 6, fixed in pairs to a central column. *Fruit* ovoid, girt by the reflexed limb of the calyx, 1-celled, 1-seeded. *Radicle* fusiform, very acuminate. *Germination* as in *Rhizophora.*

1. **K. Rheedii,** *W. & A. Prodr.* i. 310; *Arn. in Ann. Nat. Hist.* i. 365; *Blume Mus. Bot.* 135; *Wight Ill.* i. t. 89; *Hook. Ic. Pl.* t. 362; *Wall. Cat.* 4876; *Bedd. Fl. Sylv. Anal. Gen.* 100, pl. xiii. fig. 6; *Kurz For. Fl. Brit. Burm.* i. 449. Rhizopora Candel, *Linn.*; *DC. Prodr.* iii. 32.—*Rheede Hort. Mal.* vi. t. 35.

SUNDERBUNDS and tidal shores of both Peninsulas and Ceylon.—DISTRIB. Malay Islands.

A small evergreen tree. *Leaves* 2–4 by 1–2 in., narrowed at the base, quite entire, dark green above, reddish brown beneath, glabrous. *Peduncles* about 1½ in., erect, twice branched dichotomously. *Fruit* 1 in. long, conic-ovoid.

4. **BRUGUIERA,** *Lam.*

Trees. *Leaves* usually coriaceous, oblong, quite entire. *Peduncles* axillary, recurved, 1–∞-flowered. *Flowers* rather large, coriaceous. *Calyx* 8–14-merous, obconical or campanulate, ebracteate, adnate to the base of the ovary; lobes subulate-lanceolate, valvate. *Petals* oblong, 2-lobed, appendiculate, embracing the stamens which spring elastically from them when mature. *Stamens* 16–28, filaments filiform; anthers linear, mucronate, about as long as the filaments. *Ovary* 2–4-celled, included in the calyx-tube; cells 2-ovuled; style filiform, stigma 2–4-lobed minute. *Fruit* turbinate, coriaceous, crowned with the calyx-limb, 1-celled, 1-seeded. *Germination* as in *Rhizophora.*—DISTRIB. Species about 8 in the tropics of the Old World.

1. **B. gymnorhiza,** *Lamk. Ill.* t. 397; peduncles 1-flowered, calyx about 12-cleft, lobes linear acuminate erect about ¾ in. in length equalling the tube in fruit, petals densely hairy at the base nearly glabrous above 2-lobed with 2–4 bristles on each lobe and 1 in the notch, ovary 3–4-celled. *W. & A. Prodr.* 311; *Brand. For. Fl.* 219; *Miq. Fl. Ind. Bat.* i. 586; *Blume Mus. Bot.* 136; *Kurz For. Fl. Brit. Burm.* i. 450. B. Rheedii, *Miq.* l. c. 587; *Blume,* l. c. 136; *Bedd. Fl. Sylv. Anal. Gen. Pl.* xix. fig. 1; *Wight Ic.* t. 239; *Dalz. & Gibs. Bomb. Fl.* 95; *Hook. Ic. Pl.* t. 397. Rhizophora gymnorrhiza, *Roxb. Fl. Ind.* ii. 460; *Griff. Ic. Pl. Asiat.* t. 645.

Littoral and especially estuarian forests of India from the mouths of the Indus to Malacca and Ceylon.—DISTRIB. Tropical Asia, Australia, Africa and the Pacific.

A large evergreen tree. *Leaves* slightly acuminate, 3–6 by 1½–2¼ in.; stipules oblong, very deciduous. *Peduncles* cernuous, shorter than the petioles. *Flowers* about 1 in. diam. *Calyx-tube* almost campanulate, limb 10–14-cleft. *Petals* 10–14. *Radicle* fusiform with about 6 prominent angles, apex obtuse.—A variety (*B. Wightii, Bl. sp.*) growing at the mouth of the Ganges and Indian Archipelago only differs apparently from the preceding by the entire margins of the petals being more or less hairy.

2. **B. eriopetala,** *W. & A. in Wight Ill.* i. p. 210; *Ic.* t. 239 B.; peduncles 1-flowered, calyx usually about 10-cleft, lobes linear acuminate about 1 in. exceeding the ribbed tube in fruit, petals with margins densely hirsute with silvery hairs from base to apex lobes somewhat obtuse, one seta on each lobe and one longer in the notch, ovary 3–4-celled. *Wall. Cat.* 2451; *Brand. For. Fl.* 219. B. Rumphii, *Blume Mus. Bot.* 138. B. parietosa, *Griff. Notul.* iv. 670; *Ic. Pl. Asiat.* t. 641.

MALABAR; at Quilon, *Wight.* MALAYAN PENINSULA, *Griffith.*—DISTRIB. Malay Archipelago, China.

A tree. *Leaves* ovate or oblong, acuminate at both ends. *Calyx-lobes* from 9–14, somewhat triquetrous, suberect in fruit. *Anthers* linear.

3. **B. caryophylloides,** *Blume Mus. Bot.* i. 141; peduncles about 3-flowered, calyx about 8-cleft, lobes linear subacute about $\frac{1}{4}$ in. reflexed and half the length of the tube in fruit, petals ciliate from base to apex nearly erect bifid bearing 3–4 bristles and 1 in the notch, ovary 2-celled. *Miq. Fl. Ind. Bat.* i. 589; *Kurz For. Fl. Brit. Burm.* i. 450. Rhizophora caryophylloides. *Jack Mal. Misc.* i. 34; *Hook. Bot. Misc.* ii. 80; *Wall. Cat.* 4879; *DC. Prodr.* iii. 32, 8; *Arn. in Ann. Nat. Hist.* i. 368; *Wight Ill.* t. 210. R. cylindrica, *Linn. sp.* 635. Kanilia caryophylloides, *Blume Mus. Bot.* 141.—*Rheede Hort. Mal.* vi. t. 33.

TIDAL FORESTS OF INDIA, from Malabar to Malacca and Ceylon.—DISTRIB. Malay Archipelago.

A small tree. *Leaves* oblong to oblong-lanceolate, acuminate at both ends, scarcely coriaceous. *Peduncles* shorter or nearly equalling the petioles, 1–5- usually 3-flowered; *buds* subacute, pedicelled. *Calyx-tube* obtuse at the base, not ribbed. *Fruit* about $\frac{1}{2}$ in., urceolate, slightly constricted below the calyx-limb. *Radicle* subclavate, subacute.

4. **B. malabarica,** *Arn. in Wight Ill.* i. 210; peduncles about 3-flowered, calyx about 8-cleft, lobes subobtuse reflexed about $\frac{1}{4}$ in. and half the length of the tube in fruit, ovary 2-celled. Rhizophora cylindrica, *Linn. sp.* 635 *in part.* —*Rheede Hort. Mal.* vi. t. 33.

MALABAR COAST; *Rheede, Wight.*

A tree. *Leaves* herbaceous. *Peduncles* equalling the petioles, 3-flowered. *Buds* obtuse, sessile. *Fruit* about $\frac{1}{2}$ in. long, campanulate, not or scarcely constricted below the calyx-limb. *Radicle* as in the last species but apparently much *softer* than that of any other.—This may prove to be a variety or subspecies of *B. caryophylloides.*

5. **B. parviflora,** *W. & A. Prodr.* i. 311; peduncles many-flowered, calyx about 8-cleft, lobes lanceolate about $\frac{1}{12}$ in. long erect much shorter than the tube in fruit, petals with 5 bristles, ovary 3-celled, fruit subcylindric about 1 in. long, radicle subcylindric slender truncated. *Miq. Fl. Ind. Bat.* i. 588; *Wight Ill.* i. 210; *Bedd. Fl. Sylv.* 101; *Kurz For. Fl. Brit. Burm.* i. 449. Rhizophora parviflora, *Roxb. Fl. Ind.* ii. 641; *Wall. Cat.* 4877. R. cylindrica, *Roxb. Hort. Beng.* 36; *Wall. Cat.* 4877. Kanilia parviflora, *Blume Mus. Bot.* 140 t. 30; *Dalz. & Gibs. Bomb. Fl.* 95.

Littoral forests, from the SUNDERBUNDS to MALACCA.—DISTRIB. Malayan Archipelago.

A shrub or small tree. *Leaves* oblong or broadly lanceolate. *Peduncles* once or twice trichotomous. *Calyx-tube* tapering at the base, ribbed; lobes very short and rigid.

5. CARALLIA, *Roxb.*

Trees and shrubs. *Leaves* petiolate, ovate or elliptic. *Peduncles* short, rather thick. *Flowers* small, in short 3-chotomous axillary branching cymes, sessile and often crowded. *Calyx-tube* minutely bracteate at the base; limb 5–8-lobed, campanulate; lobes erect, short, valvate. *Petals* 5–8, inserted on the margin of a crenulated disk lining the calyx-tube, clawed, orbicular, 2-fid or entire, sub-serrate or lacerate at the apex. *Disk* epigynous, 10-16-lobed. *Stamens* inserted with the petals, filaments filiform; anthers small, oblong. *Style* subulate or filiform. *Fruit* small, globose, coriaceous, 1-celled, 1-seeded. *Seed* globose-reniform; testa fibrous; embryo curved.—DISTRIB. Species about 7, natives of the Indian Ocean.

1. **C. integerrima,** *DC. Prodr.* iii. 33; leaves quite entire or rarely serrulate towards the apex obovate elliptic or oblong, flowers usually 8-merous cymoso-capitate, petals not embracing the filaments. *Wight Ill.* t. 90; *Benth. in Journ. Linn. Soc.* iii. 67; *Bedd. Fl. Sylv.* t. cxciii.; *Dalz. & Gibs. Bomb. Fl.* 95; *Brand. For. Fl.* 219. C. ceylanica, corymbosa *and* sinensis, *Arn. in Tayl. Ann. Nat. Hist.* i. 371. C. lucida, *Kurz For. Fl. Brit. Burm.* i. 451; *Wall. Cat.* 4880; *Wight Ic.* t. 605. C. timorensis, *Blume Mus. Bot.* i. 128 (*ex char.*). C. octopetala, *F. Muell. Pl. Aust. Trop. Occid.* C. symmetrica, *Blume Mus. Bot.* i. 130. Pootia cereopsifolia, *Miq. Pl. Hochst.*

Forests of the outer SIKKIM HIMALAYA, BENGAL, ASSAM, SILHET, BURMAH, both PENINSULAS and CEYLON.—DISTRIB. Malay Archipelago, China, Australia.

An evergreen tree with very lucid foliage. *Flowers* small, white. *Berry* globose, size of a peppercorn, usually 1-seeded.—The leaves vary excessively. The Cingalese specimens are often all obovate and very obtuse; in some Chinese and Philippine Islands ones they are narrow-oblong and acuminate; in the majority from the greater part of the area, viz., Ceylon and the Indian Peninsulas, China, the Indian Archipelago and N. W. Australia, they are elliptic-ovate. Bentham (Journ. Linn. Soc. l. c.) has shown good cause for setting aside Roxburgh's specific name of *C. lucida*.

2. **C. lanceæfolia,** *Roxb. Fl. Ind.* ii. 481; leaves elliptic or oblong regularly serrulate, flowers 6–8-merous subcapitate, petals embracing the filaments. *Wight Ic.* iii. t. 604; *Kurz For. Fl. Brit. Burm.* i. 437; *Wight Ic.* t. 604. C. confinis, *Blume Mus. Bot.* i. 129. C. lucida, *Roxb. Cor. Pl.* iii. t. 211; *Wight Ic.* iii. t. 605. C. lanceolaria, *Wall. Cat.* 4881.

Tropical forests of TENASSERIM, *Kurz*.—DISTRIB. Sumatra.

Cymes less crowded than in the last species. *Petals* reniform, crenulate. *Fruit* larger than the preceding, turbinato-globose, 2–3-seeded.

3. **C. calycina,** *Thwaites Enum.* 121; leaves ovate or elliptical quite entire, peduncles rather long dichotomous, cymes slightly branching above the middle.

CEYLON, Singh Rajah forest, between Galle and Ratnapoora, at no great elevation, *Thwaites*.

A great tree. *Leaves* 1½–3 by 1–1¾ in., ovate, shortly acuminate, narrowed at the base, punctate beneath; petiole $\frac{1}{12}$–¼ in.; stipules about ¾ in. very deciduous. *Bracteoles* rounded, retuse, often mucronate, about $\frac{1}{12}$ in. *Flowers* subsessile, ¼ in. diam. *Calyx-lobes* 4, equalling the tube. *Petals* broadly cordate, clawed, margin inciso-sinuate. *Ovary* 4-celled; stigma crenate.

VAR. *β.* Thwaites l. c.; leaves shorter more rounded and coriaceous. Central Province, alt. 4–5000 ft., *Thwaites*.

6. PELLACALYX, *Korth.*

A small tree, ferruginously pubescent. *Leaves* oblong, minutely serrulate or entire, subscabrous above, rufescent with stellate pubescence beneath. *Flowers* subsolitary or in dichotomously branched glomerules. *Calyx* ebracteolate; limb 5–8-fid, recurved, campanulate above the ovary. *Petals* 2–6, tips lacerate. *Stamens* 10–12, inserted with the petals on the margin of a crenulated disk lining the calyx-tube, filaments short subulate; anthers small. *Ovary* with the ovuliferous part inferior, 5–10-celled; style subulate, stigma discoid, 5–10-lobed; ovules many in each cell, fascicled, pendulous from the axis. *Fruit* pisiform or turbinate, black, fleshy, 5–10-celled, many-seeded. *Seeds* ovoid, testa striated; embryo becoming green, straight, in the axis of the albumen; cotyledons scarcely broader than the terete elongated radicle.

1. **P. axillaris,** *Korth in Van der Hoev. et de Vries Tijdschr.* iii. 20, t. 2; *Benth. in Journ. Linn. Soc.* iii. 75; *Griff. Notul.* iv. 429; *Ic. Pl. Asiat.* t. 486 (Cunoniaceæ).

PENANG and MALACCA, *Griffith.*

Leaves 5–8 by 1½–3 in., shortly acuminate. *Flowers* small, shortly pedicelled, erect. *Calyx-tube* ⅙ in. long, densely ferruginously pubescent.

7. GYNOTROCHES, *Blume.*

Small trees and shrubs. *Leaves* oblong; stipules deciduous. *Flowers* small, axillary, fascicled; peduncles jointed in the middle. *Calyx* ebracteolate, 4–5-partite; segments valvate, reflexed. *Petals* 4–5, inserted below the margin of an 8–10-lobed perigynous disk, clawed, spathulate, fimbriate-lacerate. *Stamens* 8–10, inserted in the disk, filaments filiform; anthers small. *Ovary* superior, adhering by a broad base to the calyx, ovoid-globose, 3–6-angled, 3–6-celled; style columnar, furrowed, conical at the base; stigma 3–6-lobed, lobes emarginate recurved; ovules 4 in each cell, ascending, fascicled. *Berry* globose, 4–6-celled, many-seeded. *Seeds* small, obovoid, testa crustaceous wrinkled, albumen fleshy; embryo terete.—DISTRIB. Species 2, natives of the Malay Islands.

1. **G. axillaris,** *Miq. Fl. Ind. Bat.* i. pt. i. 592; *Blume Mus. Bot.* i. 127, t. xxxi.; *Kurz. For. Fl. Brit. Burm.* i. 451. G. Dryptopetalum, *Blume l. c.* G. reticulata, *A. Gray, Bot. Amer. Explor. Exped.* vol. i. 607, *ex descr.* Dryptopetalum coriaceum, *Arn. in Ann. Nat. Hist.* i. 372. Microtropis coriacea, *Wall. Cat. n.* 4338.

SINGAPORE and PENANG, *Anderson, Wallich.* MALACCA, *Griffith.* MOULMEIN, *Lobb.*—DISTRIB. Malay Archipelago.

Leaves 2–5 in., oblong or elliptic, acuminate, coriaceous. *Flowers* small, numerous, axillary, subdiœcious: male with petals and perfect stamens; ovary often empty; stigma not dilated: female or hermaphrodite flowers with longer pedicels; petals and stamens often smaller, the latter sometimes effete; stigma radially lobed. *Fruit* baccate, $\frac{1}{10}$–⅙ in. diam.

8. WEIHEA, *Spreng.*

Trees or shrubs. *Leaves* oblong, quite entire or obtusely serrate; stipules interpetiolar, oblong, deciduous. *Flowers* in axillary 1- or more flowered peduncles. *Calyx* with connate bracts; limb 4–5-fid, patent. *Petals* inserted under the margin of an obscure disk, clawed, spathulate, fimbriate-lacerate,

longer than the sepals. *Stamens* 16–30, inserted on the margin of the disk; filaments filiform; anthers oblong. *Ovary* superior, 3–5-furrowed, 2–4-celled; style filiform, stigma with 2-4 radiating lobes; ovules 2 in each cell, collateral, pendulous. *Fruit* globose, fleshy, 2–4-celled, septicidally but slowly dehiscing into 2–4 valves; cells 1–2-seeded. *Seeds* arillate, ovoid, subtrigonal, testa coriaceous; embryo straight, cotyledons elliptical, radicle terete.—DISTRIB. Species 5, natives of S. and Trop. Africa, Madagascar and Ceylon.

1. **W. ceylanica,** *Baill. Adans.* iii. 38. Anstrutheria zeylanica, *Gard. in Calc. Journ. Nat. Hist.* vi. 344, t. 4; *Thwaites Enum.* 121; *Bedd. Fl. Sylv.* t. cxciv.

MAISOR and CARNATIC, *Wight*, &c. CEYLON, Galle District, Trincomalee, &c., at no great elevation.

A very much branched shrub or small tree. *Branches* terete. *Leaves* 3–3½ by 1½ in., petioled, glabrous, acuminate, rounded at the base, green and shining above, pale beneath, nerves reticulate prominent on both surfaces; petiole about ⅓ in. *Peduncles* solitary or in pairs, shorter than the petioles. *Flower-buds* of full size six months before opening. *Calyx-limb* 4-fid; segments ovate, acute, persistent, densely covered with adpressed hairs, valvate. *Petals* 4, hypogynous, cuneate, imbricated in bud. *Stamens* about 30, hypogynous; anthers erect, cordate, obtuse. *Ovary* superior, 3-celled; style simple, persistent. *Berry* thick, spongy. *Embryo* in the axis of fleshy albumen; cotyledons flat, veined; radicle thick, elongated and directed upwards.

9. BLEPHARISTEMMA, *Wall.*

A shrub? *Leaves* opposite, petioled, membranous, elliptic-oblong, acuminate, crenately-toothed; stipules small, caducous. *Flowers* in 2–3-chotomous many-flowered axillary cymes, polygamo-diœcious. *Calyx-tube* ovoid, ebracteolate; lobes 4, minute, triangular, erect. *Petals* 4, twice the length of the calyx, inserted round a disk at the base of the calyx-tube, clawed; tips lacerate. *Disk* free; of the male, 8-toothed; of the female often cleft. *Stamens* 8, inserted upon the margin of the disk; in the female small, filaments ciliated; anthers small, oblong. *Ovary* obtusely subtrigonal, contracted at the base, ovoid, free, 3-celled; cells 2-ovuled; style of the female flower longer than the calyx, stigma obsoletely 3-lobed. *Fruit* unknown.

1. **B. corymbosum,** *Wall. Cat.* 6320; *Benth. in Journ. Linn. Soc.* iii. 78; *Bedd. Fl. Sylv. Anal. Gen. Pl.* xiv. fig. 2. Dryptopetalum membranaceum, *Miq. in Pl. Hohenack. n.* 713.

WESTERN PENINSULA, *Heyne*, &c.

Glabrous, excepting the inflorescence and buds. *Leaves* 1½–2½ in.; stipules lanceolate, membranous, pubescent. *Calyx* minutely roughened above. *Stamens* ciliated like the claws of the petals. *Disk* almost entirely free from the calyx. *Ovary* narrow, empty; style short. *Petals* in the female flowers, shorter. *Stamens* less; anthers small, effete? *Disk* smaller. *Style* longer than the calyx.

10. ANISOPHYLLEA, *Br.*

Trees and shrubs, glabrous, young parts silky. *Leaves* exstipulate, distichous; alternate ones smaller or minute, and often stipuliform or 0?, oblique, ovate lanceolate or elliptic, with 3–5 main nerves branching from the base, quite entire. *Flowers* minute in axillary simple or fascicled spikes, ebracteate or minutely bracteolate bi- or unisexual. *Calyx-tube* ovoid, adnate to the ovary, terete or ribbed; limb 4-fid, lobes erect. *Petals* 4, small, involute, entire, lobed or lacerate. *Stamens* 8, filaments short, subulate; anthers small, didymous, pro-

bably abortive in the females. *Ovary* inferior, 4-celled; styles 3–4, subulate, erect or recurved, stigmas acute or subcapitate; ovules solitary in each cell, pendulous, anatropous. *Fruit* coriaceous, oblong or pyriform, ribbed or smooth, 1-seeded. *Seed* pendulous, exalbuminous, testa coriaceous; embryo clavate, cotyledons very small or 0, radicle large.—DISTRIB. Species 5, natives of Tropical Asia and Africa.

1. **A. zeylanica,** *Benth. in Niger Flora* 342 *and* 375; leaves broadly ovate-lanceolate acuminate narrowed at the base with about five prominent nerves parting from the base, inflorescence of racemes supra-axillary solitary or geminate. *Thwaites Enum.* 119; *Bedd. Fl. Sylv.* t. 195. Tetracrypta cinnamomoides, *Gardn. & Champ. in Hook. Kew Journ.* i. 314 *and* v. 378, t. 5.

CEYLON; southern and central parts ascending to 1500 ft.

A tree 40–50 ft.; bark smooth; lower branches horizontal, upper suberect; twigs puberulous. *Leaves* glabrous on both surfaces, younger red; pairs opposite in vernation, the smaller squamiform 1-nerved caducous, the larger 5-nerved with involute margins. *Flowers* small, subsessile. *Bracts* minute. *Calyx-limb* superior, 4-cleft; lobes acute, valvate, persistent. *Petals* somewhat fleshy, laciniate, induplicate in æstivation; segments 5, linear-subulate. *Stamens* 8, alternately shorter; filaments subulate, inserted on the calyx; anthers versatile. *Styles* 4, erect, conico-subulate, stigmas capitate.

2. **A. disticha,** *Hook. in Herb.*; leaves rhomboid-oblong inequilateral 5-nerved distichous entire, flowers subsolitary, petals 3-toothed. Haloragis disticha, *Jack. in Mal. Misc.* ii. 19; *and in Hook. Journ. Bot.* i. 371.

MALAY PENINSULA; *Jack.* SINGAPORE.—DISTRIB. Sumatra

A shrub with rusty hairy branches. *Leaves* in two series, one of large leaves and another of very small stipuliform ones inserted below the insertion of the larger so as to overlap their bases; the larger 1–1½ in., subsessile, nearly glabrous above, beneath with short appressed hairs, the smaller ¼ in., similar in shape but more acute. *Calyx-lobes* persistent. *Petals* shorter than calyx, 3-fid. *Stamens* as long as the petals; anthers 2-celled. *Ovary* 4-gonous, ferruginous, 4-celled; styles 4, equalling the stamens; stigmas simple. *Drupe* oblong-ovate, red; stone with 8 longitudinal furrows, 1-seeded.

3. **A. Griffithii,** *Oliver in Trans. Linn. Soc.* xxiii. 460, t. 48; leaves lanceolate or ovate often slightly acuminate, spikes solitary or geminate.

MALACCA, *Griffith.*

Probably a tree. *Leaves* 3–4 by 1–1½ in., petiole $\frac{1}{10}$–$\frac{1}{6}$ in., coriaceous, turning yellow on drying; nerves 3, 1 central, 2 closely parallel to the margin. *Flowers* sessile, somewhat remote. *Calyx-lobes* coriaceous, triangular, valvate. *Petals* shorter than the sepals, coriaceous, broadly quadrate-oblong, entire or scarcely 3-lobed. *Stamens* 8, 4 opposite to and closely embraced by the petals, filaments rather stout; anthers small, rounded or didymous. *Ovary* 4-celled below; styles 4.

4. **A. grandifolia,** *G. Henslow*; leaves oblong acuminate scarcely narrowed at the base 5-nerved quite entire, panicles axillary with subfasciate branches.

PENANG, *Maingay.*

A tree about 50 ft., trunk very stout. *Leaves* large, 3½–10½ in., coriaceous. *Inflorescence* of several somewhat flattened or fasciate branches, forming an irregular panicle; pedicels bearing numerous minute sessile male flowers with a few female possessing rudimentary? stamens; male buds $\frac{1}{24}$ in. in diam., female rather larger. MALE FL. Sepals 4, valvate, puberulous; lobes triangular. *Petals* 4, fringed. *Stamens* 8, opposite to and embraced by the petals; filaments short. *Pistil* rudimentary;

styles 4 ?, minute, densely hairy. FEMALE FL. *Calyx-limb* partially lined with a disk, lobes each bearing a minute rudimentary stamen; anthers dehiscing in bud? *Styles* 4, spreading, subulate, densely hairy. *Drupe* narrowly pyriform, 3 by 1½ in.

ORDER LVIII. **COMBRETACEÆ.** (By C. B. Clarke, F.L.S.)

Trees, or shrubs often climbers. *Leaves* alternate subopposite or opposite, sometimes ternate, petioled, entire, simple (in *Illigera* 3-foliolate); stipules 0. *Flowers* bracteolate at base, in the tribe *Gyrocarpeæ* cymose; in the *Combreteæ* spicate or racemose (the racemes often panicled); not rarely polygamo-monœcious. *Calyx-tube* adnate to the ovary and produced above it (sometimes to a great length), the limb of 4–5 (rarely 4–7) valvate lobes. *Petals* 4–5 or 0 (rarely 6–7). *Stamens* 4–5 or 8–10 on the calyx; in the *Gyrocarpeæ* the filaments have staminodes attached at the base, and the anthers dehisce by recurved lateral valves. *Ovary* altogether inferior 1-celled; style simple, stigma simple or in *Illigera* sinuate almost lobed; ovules 1–7 (usually 2–3) pendulous from the apex of the cell. *Fruit* coriaceous or drupaceous, generally indehiscent, ovate, angular or very commonly winged; in *Calycopteris* and *Gyrocarpus* crowned by the greatly enlarged calyx. *Seed* 1, without albumen; cotyledons in *Terminalia* and others convolute; in *Combretum* and others plano-convex.—DISTRIB. Species 240, in the tropics of the whole world; and in S. Africa outside the tropic.

SUBORDER I. **Combreteæ.** *Calyx-lobes* valvate. *Stamens* without glands or staminodes at their base; anthers dehiscing by a longitudinal slit. *Ovules* 2–7, suspended by long funicles. *Flowers* racemose or spicate.

* *Petals* 0. *Calyx-limb (except in Calycopteris) deciduous.*

Flowers spiked or racemed. Calyx-limb deciduous . . . . . . 1. TERMINALIA.
Calyx-limb much accrescent on the fruit . . . . 2. CALYCOPTERIS.
Flowers capitate. Calyx-limb deciduous . . . . 3. ANOGEISSUS.

** *Petals* 5–4 (*except in Combretum apetalum*).

† *Calyx limb persistent.*

Leaves alternate. Growing with the Mangroves . . . . 4. LUMNITZERA.

†† *Calyx-limb deciduous.*

Calyx-tube above the ovary less than ½ in. long . . . . 5. COMBRETUM.
Calyx-tube above the ovary more than ½ in. long . . . . 6. QUISQUALIS.

SUBORDER II. **Gyrocarpeæ.** *Calyx-lobes* valvate or imbricate. *Stamens* with glands or staminodes at their base; anthers opening by recurved lateral valves. *Ovule* 1, suspended by a short funicle. *Flowers* cymose.

Scandent. Leaves 3-foliolate . . . . 7. ILLIGERA.
Erect tree. Leaves entire or lobed . . . . 8. GYROCARPUS.

1. **TERMINALIA,** *Linn.*

Large trees. *Leaves* alternate or subopposite, exstipulate, entire or slightly crenulate, often with glands on the petiole or near the base of the midrib beneath. *Flowers* small spicate, the racemes spikes sometimes panicled, hermaphrodite or the upper flowers on the racemes males; a narrow bract at the base of each

flower, soon deciduous. *Calyx-tube* produced above the ovary with a campanulate mouth, limb of 5 short valvate triangular lobes, deciduous. *Petals* 0. *Stamens* 10 inserted on the calyx-tube; epigynous disc within them densely hairy. *Ovary* 1-celled, inferior; style long, simple; ovules 2 or 3, pendulous from the summit of the cell. *Fruit* ovoid, very various in size, smooth or angular or winged with 2–5 wings, indehiscent, coriaceous. *Seed* solitary, exalbuminous, cotyledons convolute.—DISTRIB. Species 80; in the tropics of the whole world, less numerous in America.

T. angustifolia, *Jacq. Hort. Vindob.* t. 100 *not of Roxb.*; leaves attenuated at both ends lanceolate, with two glands at the apex of the petiole, fruit narrowly 2-winged. *Willd. Sp. Pl.* iv. 970; *DC. Prodr.* iii. 11; *W. & A. Prodr.* 312; *Miq. Fl. Ind. Bat.* i. pt. i. 599. T. Benzoin, *Linn.*; *Spreng. Syst.* ii. 358; *Lamk. Dict.* i. 349; *Wall. Cat.* 3976. Catappa Benzoin, *Gaertn. Fruct.* ii. 127, is included in the Peninsula Flora of W. & A., but there is nothing to show that it has ever been found wild in the Deccan. —DISTRIB. Central Malayan Islands.

SECT. I. **Catappa** (including *Myrobalanus*). *Fruit* not winged, ovoid or subcompressed, sometimes showing (especially when dry) two or five obscure lines or ridges.

1. **T. Catappa,** *Linn.*; *Willd. Sp. Pl.* iv. 967; leaves alternate clustered towards the ends of the branches very short-petioled obovate from a cordate but very narrow base, spikes solitary axillary simple, fruit 1–1½ in. ellipsoid slightly compressed so as to show two ridges. *Roxb. Hort. Beng.* 33 *and Fl. Ind.* ii. 430; *Lamk. Ill.* t. 848; *DC. Prodr.* iii. 11; *Wall. Cat.* 3975; *W. & A. Prodr.* 313; *Wight Ic.* 172; *Bot. Mag.* 3004; *Miq. Fl. Ind. Bat.* i. pt. i. 599; *Bedd. Fl. Sylv.* t. 18; *Kurz For. Fl. Brit. Burma,* i. 454. T. Catappa *and* Badamia, *Tulasne in Ann. Sc. Nat.* ser. iv. vol. vi. 92. T. moluccana, *Lamk. Dict.* i. 349, *not of Roxb.*; *DC. Prodr.* iii. 11; *Willd. Sp. Pl.* iv. 96 *excluding the synonym T. eglandulosa, Roxb.* T. Myrobalana, *Roth. Nov. Sp.* 378. T. subcordata, *Willd. Sp. Pl.* iv. 968. T. intermedia, *Spreng. Syst.* ii. 359. Juglans Catappa, *Lour. Fl. Cochinc.* 703. Catappa domestica, litorea *and* sylvestris, *Rumph. Herb. Amboin.* i. t. 68. Badamia Commersoni, *Gaertn. Fruct.* ii. 97.—*Rheede Hort. Mal.* iv. t. 3, 4.

Wild in the lowlands of MALAYA, and perhaps of the Transgangetic Peninsula; largely planted in all INDIA from the North-West Provinces to Ceylon and Burma, mostly at 0–1000 ft. alt.—DISTRIB. Planted in nearly all tropical countries.

Attains 80 ft., with branches in horizontal whorls. *Leaves* 6–8 in., deciduous in the cold season, usually softly hairy when young, when adult hairy or glabrous, with two glandular depressions near the base of the midrib on the under side which are often obscure or wanting; petiole ¼–¾ in. *Spikes* (and innovations) grey or rusty tomentose or pilose, the upper flowers male, the lower hermaphrodite, the bracts minute. *Calyx*-teeth glabrous or nearly so within and without. Young *ovary* glabrous or hairy. *Fruit* finally glabrous.—This species may generally be recognised by the short petiole and the very narrow but cordate base of the leaf.

2. **T. procera,** *Roxb. Hort. Beng.* 33 *and Fl. Ind.* ii. 249; leaves alternate clustered towards the ends of the branches obovate attenuated into a very short petiole, spikes solitary axillary simple, fruit ellipsoid obscurely 5-sided, not in the least compressed. *Wall. Cat.* 3974; *Kurz For. Fl. Brit. Burma,* i. 454. Terminalia sp. nov. No. 168, *Kurz. in Journ. As. Soc.* 1876, pt. ii. 130.

ANDAMANS; *Roxburgh, Kurz.* NICOBARS; *Kurz.*

Attains 100 ft. with branches in horizontal whorls. *Leaves* 6–12 in., with two glandular depressions near the base of the midrib on the under side which are often

obscure or wanting, glabrous when adult; petiole ½ in. Upper *flowers* of the spikes male, lower hermaphrodite. *Fruit* 1–1¼ in.—Much resembles *T. Catappa.*

3. **T. fœtidissima,** *Griff. Notul.* iv. 685; leaves alternate clustered towards the ends of the branches, obovate attenuated into the petiole, spikes solitary axillary simple, fruit 1½ in. obovate ellipsoid subacute, compressed with one face convex the other flat.

MERGUI and MALACCA; *Griffith.* Malacca, *Maingay* No. 644, 643½.

Leaves 6 in., glaucescent reticulate beneath, coriaceous with cartilaginous margin, without glands; petiole 1 in. *Flowers* all or very nearly all hermaphrodite. Young *ovary* and bracts very hairy. *Calyx*-teeth glabrous or nearly so within and without.

Reduced by Mr. Kurz in *Journ. As. Soc.* 1877 pt. ii. 53, 54, to *T. belerica*; from which it differs so greatly in leaves and fruit that it raises a suspicion whether Mr. Kurz had the true plant of Griffith before him.

4. **T. belerica,** *Roxb. Char. Reform.*; leaves alternate clustered towards the ends of the branches broadly elliptic narrowed equally at both ends, petiole very long, spikes solitary axillary simple, fruit ½–¾ in. diam. globular suddenly narrowed into a short stalk smooth covered by a close fulvous tomentum, when dried obscurely 5-angled.

Throughout INDIA; common in the plains and lower hills, extending to CEYLON and MALACCA; not in the desert region of the West of India.—DISTRIB. Malaya.

Attains 60–80 ft. *Leaves* 3–6 in., deciduous in the cold season, when mature glabrous and generally punctate on the upper surface; the punctations being much more permanent than in the other species (whence Roth's name); petiole 1–1½ in. *Bracteoles* minute. Upper *flowers* of the spikes male, lower hermaphrodite. Young *ovary* always tomentose. *Calyx*-teeth pubescent within and without. T. moluccana, *Miq. Fl. Ind. Bat.* i. pt. i. 601 differs from *belerica* by its short petioles; the description appears compounded out of two plants.

VAR. 1. *typica*; no glands at the apex of the petiole. T. belerica, *Bedd. Fl. Sylv.* t. 19; T. eglandulosa, *Roxb. Herb.* (*wrongly referred in Willd. Sp. Pl.* iv. 968); T. moluccana, *Roxb. Hort. Beng.* 33. *Fl. Ind.* ii. 432; T. belerica, *W. & A. Prodr.* 313 *excl. syn. Wall. Cat.* 3968; *Wight Ic.* t. 91; *Thwaites Enum.* 103; *Dalz. & Gibs. Bomb. Fl.* 91; *Brand. For. Fl.* 222; *Kurz For. Fl. Brit. Burma* i. 455; *Rheede Hort. Mal.* iv. t. 10. T. Gella, *Dalz. in Hook. Kew Journ.* iii. 227. T. punctata, *Roth Nov. Sp.* 381; *DC. Prodr.* iii. 13. Myrobalanus belerica, *Gaertn. Fruct.* ii. t. 97.

VAR. 2. *belerica*, Roxb. Hort. Beng. 33, Cor. Pl. t. 198, Fl. Ind. ii. 431; two glands at the apex of the petiole beneath the leaf. *DC. Prodr.* iii. 12; *Miq. Fl. Ind. Bat.* i. pt. i. 600.—Circar Mts., *Roxb.*; also Malaya, if T. microcarpa, *Decne. Herb. Timor.* 129; *Miq. Fl. Ind. Bat.* i. pt. i. 602; *Benth. Fl. Austral.* ii. 502 be referred here: the examples in the Kew Herbarium exactly agree but do not show the fruit.

It is remarkable that not one specimen of this typical *belerica* Roxb. exists at Kew; and that both W. & A. (Prodr. 313) and Brandis (Forest Fl. 222) expressly state that they have never been able to discover a single example. The distinction between it and Roxburgh's *eglandulosa* (*moluccana*, Willd. in Fl. Ind.) is indeed trivial; but the absence of the glands seems without exception in the Indian so-called *belerica*; while Roxburgh founded his *belerica* on the single character that it had two glands, thereby differing from his *T. eglandulosa*, which he subsequently renamed *T. moluccana, Willd.*, a species made up of two trees.

VAR. 3. *laurinoides*, Miq. Fl. Ind. Bat. i. pt. i. 600; leaves obovate or obovate-elliptic shortly acuminate much thinner than in the typical *belerica*. Mergui; *Griffith.* Ceylon; *Thwaites, Gardner, Col. Walker.*—DISTRIB. Java, Malaya. T. nitens *Presl. Epimel.* 214 is very near but has long subpersistent bracteoles.

T. bialata is much mixed (in absence of fruit) with *T. belerica*, but may generally be distinguished by the absence of punctations on the leaves.

5. **T. Chebula,** *Retz Obs.* v. 31; leaves not clustered often subopposite ovate or elliptic usually acute not acuminate and rounded at the base, spikes terminal often panicled, fruit $\frac{3}{4}$–$1\frac{1}{4}$ in. ellipsoidal or obovoid from a broad base, glabrous more or less 5-ribbed when dry. *Roxb. Hort. Beng.* 33, *Cor. Pl.* t. 197, *Fl. Ind.* ii. 433; *DC. Prodr.* iii. 12; *Wall. Cat.* 3967; *W. & A. Prodr.* 313; *Miq. Fl. Ind. Bat.* i. pt. i. 601; *Dalz & Gibs. Bomb. Fl.* 91; *Bedd. Fl. Sylv.* t. 27; *Brand. For. Fl.* 223 and t. 29; *Kurz For. Fl. Brit. Burma* i. 456. T. reticulata, *Roth. Nov. Sp.* 381; *DC. Prodr.* iii. 13. T. Aruta, *Ham. in G. Don Gen. Syst.* ii. 659. Myrobalanus Chebula, *Gaertn. Fruct.* ii. t. 97. Embryogonia arborea, *Teys. & Binn.* No. 2160 *in Hort. Bog.*

Abundant in Northern India from Kumaon to Bengal, and southward to the DECCAN table lands at 1000–3000 ft. alt., and CEYLON, BURMA and the MALAY PENINSULA.—DISTRIB. Siam, Malaya.

Attains 80–100 ft. *Leaves* 4–5 in., deciduous in the cold season, more or less hairy when young; petiole about 1 in. often with two glands near its summit. *Racemes* terminal. *Bracteoles* conspicuous in the young spikes, exceeding the flowers pubescent, but soon deciduous. *Flowers* all hermaphrodite. *Calyx*-teeth hairy within.

VAR. 1, *typica*; adult leaves nearly glabrous beneath or the interstices of the ultimate nerves with minute sunk white tomentum, young ovary shaggy without, calyx-teeth without glabrous.—Deccan, Ceylon, and Burma and Malay Peninsula.

VAR. 2 (*T. citrina of authors partly*) differs from var. 1 only in having the young ovary quite glabrous; it has the ovate fruit and round-based leaves of *T. Chebula.* Common in Northern India from Kumaon to Bengal, and in Chota Nagpore.

VAR. 3; adult leaves very shaggy beneath, fruit much smaller, often only $\frac{3}{4}$ in. Gnarled small trees on the summit of Parasnath in Behar alt. 4000 ft.: but pass by degrees into var. 2 the common form at the base of Parasnath.

VAR. 4, *tomentella, Kurz For. Fl. Brit. Burma* i. 455 (*sp.*); leaves when young densely coppery-pubescent beneath, when adult pubescent or glabrous beneath, young ovary glabrous, fruit ovoid hardly 1 in. Pegu, up to 2000 ft. alt.; *Kurz.*—This is reckoned, perhaps rightly, a species by Kurz, but the leaves are less hairy, the fruits less reduced in size than those of the preceding var.

VAR. 5, *gangetica*; *Roxb. Hort. Beng.* 33 and *Fl. Ind.* ii. 437 (*sp.*); adult leaves with brown-red silky hairs on both surfaces. *Wall. Cat.* 3967 E.; *Miq. Fl. Ind. Bat.* i. pt. i. 602. Banks of the Ganges; *Roxburgh.* North-west India, cult. *Edgeworth.* Very unlike the typical *Chebula* by the brown silky hair which covers the twigs leaves and whole inflorescence. It may be a good species but the fruit is similar to that of *Chebula.*—Roxburgh remarks that this tree ripens its fruit on the banks of the Ganges, a remark he would hardly have made had he thought the tree indigenous. It is therefore likely that *T. gangetica, Roxb.* does not grow wild within the limits of the Indian Flora.

VAR 6, *parviflora, Thwaites Enum.* 103 (*sp.*); calyx-teeth pubescent without. T. zeylanica *Heurck & Muell. Arg. Obs. Bot.* 220. CEYLON; *Thwaites.*—The flowers are not smaller nor the fruits more acutely ribbed than in some examples of *T. Chebula.*

6. **T. citrina,** *Roxb. Hort. Beng.* 33, *Fl. Ind.* ii. 435; leaves subopposite elliptic or oblong acuminate narrowed into the petiole, spikes terminal and lateral often panicled, fruit nearly 2 in. oblong-lanceolar, while fresh obscurely 5-angular. *Wall. Cat.* 3970; *DC. Prodr.* ii. 12; *Miq. Fl. Ind. Bat.* i. pt. i. 602. Myrobalanus citrina, *Gaert. Fruct.* ii. t. 97; *W. & A. Prodr.* 313; *Brand. For. Fl.* 223.

ASSAM, EAST BENGAL, BURMA and TENASSERIM; frequent. MALACCA at Mount Ophir.

Attains 80 ft. *Leaves* 3–6 in., when adult glabrous shining, the interstices of the nerves beneath with sunk close white tomentum; petiole ½ in. usually with two glands at the top or on the base of the leaf beneath. *Bracteoles* linear, conspicuous on the young spikes. *Flowers* all hermaphrodite. *Calyx*-teeth glabrous without, hairy within. Young *ovary* glabrous.—The examples from other parts of India than the East referred to *T. citrina* by collectors are in the present enumeration supposed included under *T. Chebula*. *T. citrina* has a straighter stem, a brighter foliage and narrower fruits, but ought perhaps hardly to be reckoned a distinct species.

VAR. 2. *malayana*, Kurz. in Journ. As. Soc. 1876, part ii. 130; petioles longer, fruits smaller. Nicobars; *Kurz*. Maingay sends a similar form from Malacca No. 643.

SECT. II. **Pentaptera.** *Fruit* with 5 acute subequal wings. *Spikes* usually panicled.

7. **T. Arjuna,** *Bedd. Fl. Sylv.* t. 28; leaves subopposite oblong or elliptic nearly glabrous beneath when adult, spikes usually panicled, fruits 1–2 in. nearly glabrous ovoid- or obovoid-oblong, the wings not very broad their striations curving much upwards. *Dalz. & Gibs. Bomb. Fl.* 91; *Brand. For. Fl.* 224. T. Berryi, *W. & A. Prodr.* 314; *Dalz. & Gibs. Bomb. Fl.* 92. T. glabra, *W. & A. Prodr.* 314; *Thwaites Enum.* 104; *Dalz. & Gibs. Bomb. Fl.* 91. T. ovalifolia, *Rottl. in Herb.* Pentaptera Arjuna, *Roxb. Hort. Beng.* 34 *and Fl. Ind.* ii. 438; *Wall. Cat.* 3981; *DC. Prodr.* iii. 14, *Mem. Combr.* t. 2. Pentaptera glabra, *Roxb. Hort. Beng.* 34 and *Fl. Ind.* ii. 440; *Wall. Cat.* 3979. P. angustifolia, *Roxb. Hort. Beng.* 34 and *Fl. Ind.* ii. 437.

DECCAN, CEYLON and the sub-Himalayan tracts of the NORTH WEST PROVINCES. Very common.

Attains 60–80 ft. *Leaves* usually 4–6 in. (sometimes 10 in.), suddenly narrowed at the base, often cordate, obtuse or very shortly acute at the apex; petiole rarely more than ¼ in., often very short, with two glands near its apex. *Bracteoles* very small. *Calyx*-teeth nearly glabrous both within and without. Young *ovary* very short, covered with crisped brown or rufous hair. Wings of the *fruit* usually truncate or suddenly narrowed at the top.—Dr. Brandis states that *T. Arjuna* is common in Bengal; it is unknown in east and central Bengal but abounds in Southern Behar, Chota Nagpore and on the Sone—i. e. along the whole northern face of the Deccan table-land.

VAR. 2. *angustifolia* (i. e. *Pentaptera Roxb.* and *not Terminalia angustifolia Roxb.*). Leaves narrow elongate-oblong suddenly narrowed into the petiole. Southern Peninsula and Concan. *Wall. Cat.* 3971.

8. **T. tomentosa,** *Bedd. Fl. Sylv.* t. 17; leaves subopposite or uppermost alternate elliptic or ovate glabrous or very hairy beneath when adult, spikes panicled, fruit 1–2 in. glabrous or hoary obovoid-oblong, wings broad striations carried horizontally to the edge. *Brand. For. Fl.* 225.

DECCAN, CEYLON, and the sub-Himalayan tracts of the NORTH WEST PROVINCES, NIPAL, and SIKKIM, ascending to 4000 ft.; very common. BURMA; *Brandis, Kurz.*

Attains 80–100 ft. *Leaves* 4–8 in., petiole ¼ in. *Flowers* often attacked by a Cynips producing numerous galls which simulate fruit. *Bracteoles* very small. *Calyx*-teeth without tomentose villous or glabrescent.

VAR. 1. *typica*; leaves cordate or suddenly narrowed into the petiole, adult more or less hairy beneath often very hairy, petiole with two glands near the base of the leaf, young ovary villous, fruit glabrous. T. tomentosa, *W. & A. Prodr.* 314; *Wight Ic.* t. 195. T. glabra, var. tomentosa, *Dalz. & Gibs. Bomb. Fl.* 91? T. alata, *Roth Nov. Sp.* 379; *Kurz For. Fl. Brit. Burma* i. 458. T. ovata, *Herb. Rottler*. T. Chebula, *Retz* β. minor *Huerck & Muell. Arg. Obs. Bot.* 219. Pentaptera tomentosa, *Roxb. Hort. Beng.* 34, *Fl. Ind.* ii. 440; *DC. Prodr.* iii. 14, *Mem. Combr.* t. 1; *Wall. Cat.* 3978.—Common throughout India.

VAR. 2. *crenulata*; leaves narrowed into the petiole often obovate-elliptic adult nearly glabrous beneath, young ovary glabrous. T. crenulata, *Roth Nov. Sp.* 380; *W. & A. Prodr.* 314. Pentaptera crenulata, *Roxb. Hort. Beng.* 34, *Fl. Ind.* ii. 438; *DC. Prodr.* iii. 15; *Wall. Cat.* 3978. P. macrocarpa, *Wall. Cat.* 3982.—Deccan and the sub-Himalaya; common. Burma; *Kurz. Kurz For. Fl. Brit. Burma* i. 458 states *T. crenulata*, Roth, to be *T. Arjuna* of Beddome and Brandis. But both Beddome and Brandis have stated that *T. crenulata W. & A.* is a variety included under their *T. tomentosa.* Kurz has not communicated any example of his *T. crenulata,* nor in his description does he notice the character of the venation of the fruit by which Dr. Brandis has separated *T. Arjuna* and *T. tomentosa.* The synonym *T. crenulata Kurz* remains therefore doubtful. Perhaps as Mr. Thwaites hints *T. Arjuna* (T. glabra, *Enum.* 104) and *T. tomentosa* should be made one species.

VAR. 3. *coriacea*; leaves as in *T. tomentosa typica* but beneath with a close hard fulvous tomentum rather than villous, fruit pubescent with minute fulvous hairs. T. coriacea, *W. & A. Prodr.* 315. Pentaptera coriacea, *Roxb. Hort. Beng.* 34, *Fl. Ind.* ii. 438.—Mountains of the Coromandel Coast; *Roxburgh.* Deccan; *Herb. Rottler.* Malabar Hills; *Dr. Ritchie.*

SECT. III. **Chuncoa.** *Fruit* with three very unequal wings, rarely more than ¾ in., often much smaller.

9. **T. paniculata,** *Roth Nov. Sp.* 383; leaves oblong or elliptic acute adult nearly glabrous, panicles compound, fruit brown-red villous with one very broad and two narrow wings. *W. & A. Prodr.* 315; *Dalz. & Gibs. Bomb. Fl.* 92; *Bedd. Fl. Sylv.* t. 20; *Brand. For. Fl.* 226. T. monoptera, *Roth Nov. Sp.* 382. T. trioptera, *Heyne in Herb. Rottl.* Pentaptera paniculata, *Roxb. Hort. Beng.* 34, *Fl. Ind.* ii. 442; *DC. Prodr.* iii. 14; *Wall. Cat.* 3980. Hiptage sp., *Wall. Cat.* 9029.

MALABAR; lower hills from Bombay to Cochin; common: NILGHIRI and KURG mountains.

A large tree, the innovations rusty-tomentose. *Leaves* 4–7 in., lower subopposite, upper alternate, base cordate, two glands generally present near the base of the midrib beneath; petiole ½–¾ in. *Spikes* very dense, bracteoles and young ovaries villous. *Fruit* about ¼ in. long, with one wing ½ in. broad, the other two wings hardly ⅛ in. broad.

10. **T. pyrifolia,** *Kurz For. Fl. Brit. Burma* i. 457; leaves crowded towards the ends of the branches oblong- or broadly-lanceolate glabrous, spikes simple, fruit indistinctly brown velvety with two broad wings and one very narrow one. Pentaptera pyrifolia, *Presl Epimel. Bot.* 215.

PEGU to TENASSERIM, frequent; *Kurz, Helfer* (ex Presl). PROME; *Maclelland.*

Attains 80 ft.; glabrous except the innovations and spikes. *Leaves* 2–4 in., coriaceous, narrowed into the petiole; petiole ¾–1½ in., without glands. *Calyx* densely tawny or brown-pubescent. *Fruit* ½–¾ in. long, the two lateral wings about ½–¾ in. broad, chartaceous, rounded and striated.—Mr. Kurz cites as a doubtful synonym T. javanica, *Miq. Fl. Ind. Bat.* i. pt. i. 602; the example of which at Kew agrees, but has no fruit.

11. **T. myriocarpa,** *Heurck & Muell. Arg. Obs. Bot.* 215; leaves oblong or elliptic acute, adult nearly glabrous, petiole very short, spikes panicled, fruit yellow shining with two very broad wings and one narrow one. *Kurz For. Fl. Brit. Burma* i. 457. Pentaptera Saja, *Wall. Cat.* 3983.

Subtropical valleys in SIKKIM and BHOTAN, alt. 1000–3000 ft., abundant. ASSAM HILLS; *Simons, Griffith.*—DISTRIB. Ava, Bhamo.

Attains 80–100 ft., the innovations pubescent-tomentose. *Leaves* 4–8 in., base obtuse, nerves numerous and very parallel, upper subopposite; petiole about ¼ in.,

usually with two glands at its apex. *Spikes* dense, bracteoles and young ovaries villose. Epigynous *disc* with very little or no hair. *Fruits* $\frac{1}{8}$–$\frac{3}{16}$ in. long, exceedingly numerous, minutely villous, broad wings each $\frac{1}{4}$ in. wide puberulous, the third acute hardly winged.—The top of the tree in flower appears pink, the middle white, from the panicles changing colour.

SECT. IV. *Fruit* large, 1–1½ in., with two very broad wings. (Really allied to Sect. *Catappa*).

12. **T. bialata,** *Kurz For. Fl. Brit. Burma* i. 456; leaves clustered near the ends of the branches obovate narrowed into a very long petiole, spikes axillary simple elongate, fruit 2–3½ in. wide rusty tomentose. Pentaptera bialata, *Roxb. Hort. Beng.* 34; *Fl. Ind.* ii. 441; *Wall. Cat.* 3986.

BURMA and the ANDAMANS; *Maclelland, Kurz.*

Attains 80–100 ft. *Leaves* 5 in., glabrous when adult; petiole 2½–3½ in. *Spikes* very long, the upper flowers male, the lower hermaphrodite. Young *ovary* and calyx brown-pubescent or tomentose. *Calyx*-teeth hairy within. *Fruit* 1¼–1¾ in. long.

VAR. *cuneifolia,* Wall. Cat. 3972; leaves lanceolate rather than obovate, fruit less than 1 in. long and nearly glabrous.—Prome; *Wallich.* Tenasserim and Andamans; *Helfer* No. 2182 Kew Distrib.

DOUBTFUL SPECIES.

T. MOLUCCANA, *Wall. Cat.* 3969 consists of leaves generally resembling those of *T. procera,* and a detached fruit which also resembles that of *T. procera.* But the petioles have a thickening simulating an articulation, and M. Planchon has suggested (by a note on the specimen) that the leaves are those of an *Elæocarpus.*

T. ANGUSTIFOLIA, *Roxb. Hort. Beng.* 33 and *Fl. Ind.* ii. 437; a large tree, tender parts hairy, leaves narrow-lanceolate acuminate glandular on the margin at the base, fruit scarcely distinguishable from that of *T. Chebula,* young leaves with much ferruginous hair. T. travancorensis, *W. & A. Prodr.* 314. Tinnevelly and Travancore, *Roxburgh.*—No example known and not seen by anyone except Roxburgh; if it be not a variety merely of *T. Chebula.*

T. BENGALENSIS, *Roxb. in DC. Prodr.* iii. 12; leaves alternate obovate obtuse entire glabrous on both surfaces and the petioles without glands. In Bengal.—This species is not known by any authentic specimen and is insufficiently described: it is improbable that it is distinct from all the other known species.

2. CALYCOPTERIS, *Lamk.*

A diffuse shrub with drooping branches. *Leaves* opposite, shortly petioled, elliptic or ovate, acuminate, entire. *Racemes* dense, axillary, and crowded towards the ends of the branches so as to form large panicles. *Flowers* small, greenish, each with a lanceolate bract. *Calyx*-tube 5-striate, produced above the ovary; limb 5-fid, persistent and much enlarged in fruit. *Petals* 0. *Stamens* 10, the five upper ones between the calyx-teeth, the five others alternate with them and lower down on the calyx-tube. *Ovary* 1-celled, inferior; style subulate, simple; ovules 3, pendulous from the top of the cell. *Fruit* narrow ovoid, 5-ribbed, villous, 1-seeded, surmounted by the enlarged calyx. *Cotyledons* convolute.

1. **C. floribunda,** *Lamk. Dict. Supp.* ii. 41 *and Ill.* t. 357; *Brand. For. Fl.* 220. C. nutans, *Kurz For. Fl. Brit. Burma* i. 468. Getonia floribunda, *Roxb. Cor. Pl.* t. 87 *and Fl. Ind.* ii. 428; *Roth Nov. Sp.* 216; *DC. Prodr.* iii. 15; *Dalz & Gibs. Bomb. Fl.* 91; *Miq. Fl. Ind. Bat.* i. pt. i. 605; *W. & A. Prodr.* 315; *Wall. Cat.* 4013. G. nutans, *Roxb. Hort. Beng.* 33 *and Fl. Ind.*

ii. 428; *Wall. Cat.* 4012; *Miq.* l. c.; *DC. Prodr.* iii. 15. Getonia nitida, *Roth Nov. Sp.* 217. Combretum sericeum, *Wall. in Herb. Calc.*

On hot hills, alt. 500–2500 ft., abundant throughout the DECCAN and from ASSAM to SINGAPORE.

A dense shrub 6–12 ft. high, often gregarious, diffuse with drooping branches, not at all scandent, generally rusty villous; in the variety *nitida* of Roth the upper surface of the leaves is glabrous shining. *Leaves* 2–5 in., not narrowed into the petiole which is $\frac{1}{4}$–$\frac{1}{2}$ in. *Panicles* often large and then more or less nodding. *Flowers* very like those of *Terminalia* and hardly larger. Base of *stamens* and style pilose or glabrous. *Calyx*-lobes in fruit $\frac{1}{3}$–1 in. long, broad-lanceolate, becoming more or less papery, sometimes transparent showing conspicuously the veins. *Fruit* itself less than $\frac{1}{4}$ in. long. Kurz, in *Journ. As. Soc.* 1877, pt. ii. 59, divides this shrub into two species, viz.:—

1. *C. nutans*; leaves pubescent rarely almost glabrous, longer stamens $\frac{1}{4}$–$\frac{1}{3}$ as long as the calyx-lobes.

2. *C. floribunda*; leaves glabrous, longer stamens as long as the long bluntish calyx-lobes.

3. ANOGEISSUS, *Wall.*

Trees or shrubs. *Leaves* alternate or falsely opposite, petioled, entire. *Flowers* in dense globose heads, on axillary peduncles much shorter than the leaves. *Calyx*-tube long attenuated above the ovary, subpersistent; limb small with 5 lobes, deciduous. *Petals* 0. *Stamens* 10 in two series. *Ovary* inferior, 1-celled; style filiform, simple; ovules 2 pendulous from the top of the cell. *Fruits* small, coriaceous, compressed 2-winged, packed horizontally into dense heads. *Seed* 1; cotyledons convolute.—DISTRIB. Species 5: of which one is Tropical African, the other four Indian.

1. **A. latifolia,** *Wall.*; *Bedd. Fl. Sylv.* t. 15; leaves broad elliptic obtuse at both ends, peduncles 1 or more from the same axil often branched, bracteoles inconspicuous, ripe fruits shining glabrous the beak as long as the nucleus or longer. *Wall. Cat.* 4015; *Brand. For. Fl.* 227. Conocarpus latifolia, *DC. Prodr.* iii. 17; *Roxb. Hort. Beng.* 34 *and Fl. Ind.* ii. 442; *Royle Ill.* t. 45; *W. & A. Prodr.* 316; *Wight Ic.* t. 994; *Dalz. & Gibs. Bomb. Fl.* 91; *Miq. Fl. Ind. Bat.* i. pt. i. 605. Andersonia altissima, *Herb. Madr.*

From the HIMALAYA to CEYLON; very common, ascending to 3000 ft. Not in the Transgangetic Peninsula.

Attains 80 ft., but usually occurs as a small tree; leafless during most of the hot season. *Leaves* sometimes 5 in. with a petiole $\frac{1}{2}$ in., usually much smaller, sometimes acute, never acuminate. Innovations and *peduncles* more or less rusty-pubescent. *Fruit* sometimes $\frac{3}{8}$ in. (excluding the beak) by $\frac{1}{4}$ in. including the wings, usually smaller, more or less rusty-pubescent when young.

VAR. *glabra*; leaves glabrous beneath.

VAR. *villosa*; leaves small densely rusty villose on both surfaces. Mysore, *C. B. Clarke.*

VAR. *parvifolia*; leaves small ($\frac{1}{2}$ in.) silky pubescent. Central Provinces. *Brandis For. Fl.* 228.

2. **A. acuminata,** *Wall.*; *Bedd. Fl. Sylv.* t. 16; leaves elliptic or oblong acute at both ends villous or pubescent beneath, peduncles solitary (rarely clustered) very rarely divided, ripe fruits shining glabrous. *Wall. Cat.* 4014; *Brand. For. Fl.* 228; *Kurz For. Fl. Brit. Burma* i. 466. A. hirta, *Wall. Cat.* 4016. Conocarpus acuminata, *Roxb. Hort. Beng.* 34 *and Fl. Ind.* ii. 443; *W. & A. Prodr.* 316; *DC. Prodr.* iii. 17 *and Mem. Combr.* t. 3; *Miq. Fl. Ind. Bat.* i. pt. i. 605.

VAR 1. *typica*; leaves usually broad-lanceolate fulvous beneath, peduncles with obovate bracts often leaflike large, fruit very broadly winged (twice as broad as high) with a deflexed pubescent beak much longer than the nucleus. Andersonia acuminata, *Herb. Rottl.*

The northern edge of the DECCAN ascending to 3000 ft. BUNDELKUND, *Edgeworth.* Mountains above the Circars; *Roxburgh.* GODAVERY forests; *Brandis.* North-west India, *Royle.*

A tree, sometimes attaining 60 ft.; trunk rarely straight, when young armed with long spines (Kurz). *Leaves* commonly 2½ by 1 in., upper becoming smaller, often obovate, passing into bracts; petiole less than ¼ in. *Peduncles* and neck of ovary rusty-tomentose.

VAR. 2. *lanceolata,* Wall. Cat. 4014 F; leaves usually narrow-lanceolate grey beneath, bracteoles on the peduncles small linear very deciduous, fruit winged subquadrate with an erect beak shorter than the nucleus. Andersonia lanceolata, *Herb. Rottl.*

PEGU, TENASSERIM and KOOKIE-LAND.

An erect elegant tree 60–100 ft. high. *Leaves* commonly 2 by ½ in., upper long-lanceolate; petiole scarcely any. *Peduncles* and neck of ovary with dense rusty spreading hairs. *Fruits* sometimes ¼ in. broad.

3. **A. phillyreæfolia,** *Heurck & Muell. Arg. Obs. Bot.* 209; leaves narrowly lanceolate narrowed upwards obtuse, peduncles short rarely divided, heads and fruit small, beak about as long as the nucleus. *Wall. Cat.* 8557.

PROME; *Wallich.*

Apparently a shrub or small tree. *Leaves* 1½ in., subsessile, narrowed at base, glabrous or silky beneath. *Peduncles* ¼–⅜ in., solitary or clustered, rusty-pubescent, much less shaggy than in *A. acuminata var. lanceolata.* *Fruits* about $\frac{1}{18}$ in. broad.—Kurz, in *Journ. As. Soc.* 1874, pt. ii. 188, reduces this to *A. acuminata*; but from the example he has communicated to Kew it appears that his *A. phillyreæfolia* is not the plant of *Heurck & Muell.* but *A. acuminata var.* 2 above. The present species however may prove only a more extreme form of *A. acuminata.*

4. **A. pendula,** *Edgw. Cat. Pl. Banda,* p. 47; leaves elliptic or obovate acute or obtuse always narrowed at base, peduncles solitary simple, fruit subquadrate ultimately glabrous, beak much less than half the height of the nucleus. *Brand. For. Fl.* 229. A. myrtifolia, *Wall. Cat.* 4017; *Royle Ill.* p. 209.

BUNDELKUND; *Edgeworth.* NORTH-WEST INDIA; *Royle.* Common in RAJPUTANA; *Brandis.* DEESA; *Stocks.*

A gregarious bush or small tree. *Leaves* ¾–1 in., usually glabrous, sometimes silky beneath. *Peduncles* sometimes with an elliptic leaflike bract.—A species which may be distinguished at once by its small leaves.

4. LUMNITZERA, *Willd.*

Large glabrous shrubs or small trees, growing in tropical salt marshes along with Mangroves and closely resembling them in habit. *Leaves* clustered towards the ends of the branches, alternate, thickly leathery, subsessile, narrow-obovate, entire or scarcely crenate. *Flowers* in racemes. *Calyx*-tube with two adnate bracteoles near the base, oblong, narrowed at both ends, produced above the ovary; lobes 5 persistent. *Petals* 5, oblong. *Stamens* 10 in two series, or fewer. *Ovary* inferior, 1-celled; style subulate, simple; ovules 2–5 pendulous from the top of the cell. *Fruit* woody, elliptic-oblong, ½–1 in. including the calyx-limb, longitudinally striate or nearly smooth. *Seed* 1; cotyledons convolute.—DISTRIB. Species 2; on the shores of the tropics of the Old World, and of Polynesia.

1. **L. coccinea,** *W. & A. Prodr.* 316; racemes dense terminal sometimes 2 or 3 forming a small corymb, petals scarlet ¼ in. *Miq. Fl. Ind. Bat.* i. pt. i. p. 606. L. littorea, *Voigt.*; *Kurz For. Fl. Brit. Burma,* i. 469. L. pentandra, *Griff. Notul.* iv. 684, *and Ic. Pl. Asiat.* t. 644. Pyrranthus littoreus, *Jack. Mal. Misc.* ii. 57; *Wall. Cat.* 4018.

MERGUI; *Griffith.* NICOBARS; *Kurz.* MALACCA; *Maingay, Griffith.*—DISTRIB. Malaya, North Australia, Polynesia.

A small tree 20–40 ft. high. *Leaves* 2–3½ in. *Stamens* 5–10, usually 7; twice as long as the petals, filaments crimson.

2. **L. racemosa,** *Willd.*; *DC. Prodr.* iii. 22; racemes axillary somewhat dense in flower 2–4 in. long in fruit, petals white very small. *W. & A. Prodr.* 316; *Miq. Fl. Ind. Bat.* i. pt. i. 606; *Dalz & Gibs. Bomb. Fl.* 90; *Tulasne in Ann. Sc. Nat. Ser.* iv. vol. vi. p. 103; *Bedd. Fl. Sylv. Anal. Gen. Pl.* xxi.; *Brand. For. Fl.* 221; *Kurz For. Fl. Brit. Burma* i. 468. Pyrranthus albus, *Wall. Cat.* 4019. Petaloma alternifolia, *Roxb. Fl. Ind.* ii. 372. Bruguiera madagascariensis, *DC. Prodr.* iii. 23.—*Rheede Hort. Mal.* vi. t. 37.

On the coasts of INDIA, CEYLON and the TRANSGANGETIC PENINSULA as on the ANDAMANS and NICOBARS (Kurz); general.—DISTRIB. Tropical Africa, Malaya, North Australia and Polynesia, in the Mangrove swamps.

A small tree 20–40 ft. high. *Leaves* usually 2–3 in. sometimes only 1 in. *Stamens* sometimes 5, sometimes 10 (always 10 *Kurz*) about as long as the petals, filaments white. *Racemes* in fruit ascending.

5. **COMBRETUM,** *Linn.*

Large shrubs (except *C. nanum*) with long pendent or scandent branches, without spines (except *C. spinescens*). *Leaves* entire, petioled, opposite or more seldom alternate or ternate. *Flowers* polygamo-diœcious, often in panicled spikes or racemes; bracteoles small. *Calyx*-tube constricted above the ovary, shortly or long produced, urceolate, funnel-shaped or tubular; limb 4–5-lobed, deciduous. *Petals* as many as the calyx-lobes (0 in *C. apetalum*) placed on the calyx-limb. *Stamens* twice as many as the petals, inserted in two series with them. *Ovary* inferior, 1-celled; style 1, subulate, simple; ovules 2–5, pendent from the top of the cell. *Fruit* with 4–5 wings angles or ridges, dry, generally indehiscent. *Seed* 1; cotyledons plaited or flat, in a few species convoluted.—DISTRIB. Species 120, common in the tropics of America, Africa, and Asia; also in South Africa, but not in Australia or Polynesia.

SECT. I. **Poivrea.** *Flowers* 5-merous. *Fruit* 5-winged or 5-ridged.

* *Fruit with 5 membranous wings.*

1. **C. decandrum,** *Roxb. Cor. Pl.* t. 59; leaves oblong suddenly acuminate nearly glabrous on both surfaces when adult, panicles large terminal, young ovary densely villose, calyx hardly constricted above the ovary urceolate covered with short hairs within and without. *Roxb. Hort. Beng.* 28 *and Fl. Ind.* ii. 232; *G. Don in Trans. Linn. Soc.* xv. 437; *Wall. Cat.* 4009; *Brand. For. Fl.* 221; *Kurz For. Fl. Brit. Burma* i. 460. C. Roxburghii, *Spreng. Syst.* ii. 331. Poivrea Roxburghii, *DC. Prodr.* iii. 18; *W. & A. Prodr.* 317. Pentaptera Roxburghii, *Tulasne in Ann. Sc. Nat. Ser.* iv. vol. vi. 84.

BENGAL, abundant, alt. 0–3000 ft. North DECCAN plateau very common, less common South. NORTH WEST PROVINCES nearly to the Punjab. TENASSERIM and the ANDAMANS.

An exceedingly large shrub with many branches pendent and subscandent, conspicuous in flower by the floral leaves (bracts) becoming cream-white. *Leaves* opposite, 4–5 in., somewhat hairy when young, when old glabrous or rarely with tufts of hairs in the axils of the nerves beneath; petiole $\frac{1}{8}$ in. *Racemes* numerous, very villous, in large terminal quasi-panicles, the leaves thereon 2–3 in, becoming petaloid at the time of flowering; bracteoles linear, $\frac{1}{4}$ in., somewhat persistent. *Ovary* sessile. *Calyx* segments lanceolate-subulate, suberect. *Petals* oblong, glabrous, hardly exceeding the calyx or twice as long as the calyx (*Kurz*). *Disc* covered with short hairs. *Fruit* $\frac{3}{4}$–$1\frac{1}{4}$ in., oblong or elliptic, subquadrate, nearly smooth.

2. **C. pilosum,** *Roxb. Hort. Beng.* 28, *Fl. Ind.* ii. 231; leaves oblong-lanceolate adult more or less hairy beneath, panicles terminal the racemes densely fulvous-villous and congested, young ovary fulvous-villous, calyx shortly constricted above the ovary then funnel-shaped hairy within and without. *G. Don in Trans. Linn. Soc.* xv. 434; *Wall. Cat.* 4005; *Kurz For. Fl. Brit. Burma* i. 462. C. lætum and spinescens, *Wall. Cat.* 4004, 4006. C. insigne, *Heurck & Muell. Arg. Obs. Bot.* 247 (*from description only*).

East Bengal; alt. 0–1000 ft., from Silhet to Mergui frequent.

A large scandent shrub without thorns, the innovations densely rusty-villous. *Leaves* opposite, 4–8 in., usually when adult with some rusty hair at least on the lower surface (but some of Griffith's specimens are quite glabrous); petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Bracteoles* $\frac{1}{4}$ in., narrow-lanceolate, somewhat persistent. *Ovary* sessile. *Calyx*-tube upwards 5-fluted, the segments triangular acute erect. *Petals* narrow-obovate, far exceeding the calyx, with rusty silky hairs on their backs. *Disc* low in the funnel of the calyx with short hair. *Fruit* 1 in., elliptic or circular, usually pubescent, sometimes glabrous.

Var. 2. *spinescens*; with stout spines at the base of the branchlets, otherwise does not differ. Irrawaddy bank; *Wall. Cat.* 4006. Cachar, *Keenan.*

Here perhaps belongs the very doubtful species described by Kurz in *Forest Fl. Brit. Burma*, i. 462 under the name *C. ovale*, R. Br., which is said to differ from *C. pilosum* by having the innovations puberulous instead of pubescent. The fruit is unknown. It can hardly be *C. ovale*, R. Br. which considerably differs as see under *C. aculeatum, Vent. in Oliv. Fl. Trop. Afr.* ii. 423.

3. **C. apetalum,** *Wall. Cat.* 3990; leaves oblong-lanceolate adult nearly glabrous, panicles terminal large much divided the ultimate racemes long slender distant, young ovary densely pubescent almost tomentose, calyx-tube hardly constricted above the ovary then urceolate pubescent within and without. *Kurz For. Fl. Brit. Burma* i. 460. C. virgatum, *Wall. Cat.* 3992.

Pegu; *Wallich, Maclelland, Kurz.*—Distrib. Burma.

A scandent shrub or (ex Kurz) a weak tree 15–20 ft. high. *Leaves* 1–4 in., subopposite, the petiole $\frac{1}{8}$–$\frac{1}{4}$ in., and midrib beneath usually grey puberulous, sometimes long fulvous hair near the base of the main nerves beneath. *Racemes* long, undulating, very narrow, the flowers though numerous being very small; bracteoles $\frac{1}{8}$ in., linear, exceeding the young ovaries. *Ovary* sessile. *Calyx*-teeth lanceolate, erect. *Petals* 0. *Disc* covered by short hairs. *Fruit* $\frac{3}{4}$ in., elliptic, nearly circular, glabrous, surface between the wings covered with close sessile circular glands.

4. **C. pyrifolium,** *Kurz For. Fl. Brit. Burma* i. 464; leaves small ovate to broad-oblong and suborbicular glabrous, spikes puberulous in slender axillary or short terminal panicles, fruits 5- or occasionally 4-winged. Pentaptera pyrifolia, *Wall. Cat.* 3985.

Pegu; *Kurz.*—Distrib. Burma.

A scandent shrub, with the habit of *Combretum ovalifolium*, the innovations rusty puberulous. *Leaves* $1\frac{1}{2}$–2 in., opposite or alternate, punctate on the upper surface,

petiole $\frac{1}{3}$ in. *Fruit* $\frac{1}{2}$–$\frac{3}{4}$ in., glabrous.—Herbarium twigs of this species are much like whole plants of *C. nanum*, but the fruits are hardly half as long.

** *Fruit with 5 sharp angles.*

5. **C. trifoliatum,** *Vent. Choix* t. 58; leaves lanceolate or elliptic narrowed at both ends glabrous, spikes lateral and terminal often compound rusty-villous, calyx-tube hardly constricted above the ovary then urceolate silky. *G. Don in Trans. Linn. Soc.* xv. 439; *Miq. Fl. Ind. Bat.* i. pt. i. 610; *Kurz For. Fl. Brit. Burma* i. 461. C. lucidum, *Blume Bijd.* 641. C. undulatum and C. elegans, *Wall. Cat.* 3993, 4003. C. subalternans, *Wall. Cat.* 4008? Terminalia lancifolia, *Griff. Notul.* iv. 685. Embryogonia lucida, *Blume Mus. Bot.* ii. t. 52. Cacoucia? trifoliata, *DC. Prodr.* ii. 22. C. lucida, *Hassk. in Flora* 1844, p. 607.

TRANSGANGETIC PENINSULA from PEGU to SINGAPORE, alt. 0–1000 ft., frequent.—DISTRIB. Burma, Java.

A scandent shrub. *Leaves* 2–4$\frac{1}{2}$ in., opposite, not seldom ternate, sometimes subalternate, usually shining, the petiole $\frac{1}{8}$–$\frac{3}{8}$ in. (and sometimes the midrib) pubescent. *Bracteoles* linear, small, early deciduous. *Ovary* sessile. *Calyx*-teeth lanceolate, erect. *Petals* narrow, little exceeding the calyx. *Disc* and base of the calyx-tube within covered with long hair. *Fruit* about 1$\frac{1}{4}$ in., and half as broad, shining, black.

SECT. II. **Tetragonocarpus.** *Flowers* 4-merous. *Fruit* with 4 obtuse or acute ridges, the ridges not expanded into thin papery wings.

6. **C. tetralophum,** *C. B. Clarke*; leaves lanceolate glabrous or nearly so, racemes in subterminal panicles which are ferruginous and covered with scales but only slightly villose, calyx-tube constricted above the ovary then urceolate covered with ferruginous scales, fruit with very acute ridges.

MALACCA, *Griffith* (Kew Distrib. No. 2195)=Combretum No. 19 of *Hk. f. & T. distrib.*—DISTRIB. Siam, Borneo.

A scandent shrub. *Leaves* 4–5 in., opposite, shining, often with a little rusty hair along the base of the midrib beneath; young remotely glandular-punctate; petiole $\frac{1}{8}$–$\frac{3}{8}$ in. *Bracteoles* $\frac{1}{16}$ in., soon deciduous. Constricted part of the *calyx*-tube nearly as long as the young ovary, the teeth triangular erect covered without by close flat sessile ferruginous glandular scales. *Petals* narrow, hardly exceeding the calyx-teeth. *Disc* and base of the calyx within densely covered by long fulvous hair. *Fruit* $\frac{3}{4}$–1 in. and half as broad, shining, black.—This species in the fruit and leaves so much resembles *C. trifoliatum* above that it has been mixed with it as a 4-fid variety: but the flowers are altogether different, and there is not one 5-angled fruit on any of the Kew specimens.

7. **C. tetragonocarpum,** *Kurz For. Fl. Brit. Burma* i. 461; leaves elliptic obtuse coriaceous glabrous, spikes robust fulvous-villous axillary solitary and in thin terminal panicles, calyx-tube and ovary rusty-villous, fruit with four thick coriaceous prominent angles.

Swamp forests of PEGU; frequent, *Kurz.*

A glabrous large scandent shrub. *Leaves* 3–5 in., younger remotely glandular-punctate; petiole less than $\frac{1}{4}$ in. *Flowers* small. *Calyx*-tube short; limb cup-shaped with 4 short acute teeth, scaly and pubescent without, densely villous within. *Petals* minute. *Fruit* 1 in. and more, glabrous, pale brown, elliptic-ovate, the angles thick coriaceous sharp prominent and almost winglike, much narrower than the diameter of the nut.

The example of this species communicated to Kew by Kurz exhibits neither fruit nor flowers; the character of the species is therefore copied from Mr. Kurz.

It is evidently allied to *C. tetralophum*; the leaves on Mr. Kurz' specimen are very unlike those of *C. tetralophum*, but in many *Combretums* while the typical leaves are acute lanceolate there may be found on the same shrub lower branches with obtuse obovate leaves. Kurz however says that the calyx-tube in *C. tetragonocarpum* is "short oval," whereas in *C. tetralophum* it is "elongate nearly filiform," so that the two species must be distinct. He has placed this species in his section with 10 stamens and 5-merous flowers: this it is presumed is a slip.

8. **C. acuminatum,** *Roxb. Hort. Beng.* 28, *Fl. Ind.* ii. 228; leaves opposite ovate-lanceolate to lanceolate adult pubescent or nearly glabrous beneath, racemes scarcely divided axillary and also in sparingly leafy terminal panicles scaly and pubescent, calyx scarcely constricted above the ovary then campanulate, fruit narrowly oblong with four thick bluntish ridges. *Wall. Cat.* 3998. C. costatum, *Roxb. Hort. Beng.* 28 *and Fl. Ind.* ii. 227; *Kurz For. Fl. Brit. Burma* i. 465. C. stenopetalum, *Heurck & Muell. Arg. Obs. Bot.* 225. C. sarcopterum, *Thwaites Enum.* 415. C. neurophyllum? *Miq. Fl. Ind. Bat.* i. pt. i. 608 *ex descript.*

Transgangetic Peninsula from Assam to Singapore, alt. 0–1000 ft., plentiful. Ceylon; *Thwaites, Mrs. Walker.* Madras Peninsula? *Wight* No. 1014 (Wight's specimen is typical *acuminatum* but may have come from Ceylon).—Distrib. Malaya to the Philippines.

A large scandent shrub. *Leaves* often 6–8 in., cordate or acute at the base, somewhat densely glandular-punctate beneath, the glands often prominent or becoming scales; petiole often very short, rarely exceeding ⅜ in. *Bracteoles* minute, soon deciduous. Young *ovary* and calyx-tube scaly, hardly pubescent. *Calyx*-limb campanulate, grooved or fluted (at least in the dried specimens), teeth erect short triangular. *Petals* narrow, small. *Disc* and base of calyx-tube with short hair or nearly glabrous. *Fruit* 1–2 in. about ⅓ as broad as long, puberulous brown.—In this species, and in some others, in the hermaphrodite flowers before the calyx expands a very small hole appears at the top through which the style is long protruded; subsequently the calyx opens and the stamens are long extruded.

The examples of *C. acuminatum, Roxb.* at Kew are abundant, but the name *C. costatum Roxb.* does not occur in the Kew Herbarium nor is the fruit described by Roxb. It is clear that Mr. Kurz understands by *C. costatum, Roxb.* the plant named *C. acuminatum, Roxb.* at Kew. It is almost certain that the two species of Roxburgh are but one. The two names are of one date, and in this list the name taken up by Wallich and subsequent Indian botanists is preferred to the name taken up by Mr. Kurz, especially as there is no doubt at all what Roxburgh's *C. acuminatum* was, while a doubt may be still raised about his *C. costatum.*

Sect. III. **Eucombretum.** *Flowers* 4-merous. *Fruit* with 4 papery wings. *Calyx* not long-tubular-campanulate above the constricted portion.

† *Surface of the fruit between the wings covered densely with lanceolate-linear scales* ⅛–¼ *in.* (Subsection *Flagrocarpeæ*).

9. **C. flagrocarpum,** *Herb. Calc.*; leaves opposite elliptic- or ovate-lanceolate adult pubescent and prominently glandular-punctate beneath, racemes rusty-pubescent simple axillary and also crowded towards the ends of the branches, calyx funnel-shaped above the ovary glandular and somewhat pubescent without. Pentaptera undulata, *Wall. Cat.* 3984 (*not* Combretum undulatum, Wall.). Combretum sp. No. 20, *Herb. Hk. f. & T.* C. Wallichii, *Kurz For. Fl. Brit. Burma* i. 465 *not of DC.*

Northern and Eastern Bengal, ascending the hills to 5000 ft. alt.; very common, extending to Chittagong.—Distrib. Upper Burma.

A large scandent shrub. *Leaves* 4–6 in. (always large and generally more than 2 in. broad), even on the upper surface glandular-punctate and pubescent on the nerves, only ultimately becoming glabrous; petiole $\frac{1}{8}$–$\frac{3}{8}$ in. *Bracteoles* often $\frac{1}{4}$ in., linear, subpersistent. *Calyx*-teeth erect, short, triangular. *Petals* obovate, much longer than the calyx. *Disc* and base of calyx within clothed with short hair. *Fruit* 1–1$\frac{1}{4}$ in. long and as broad, puberulous, brilliantly red or dark brown.

10. **C. Wallichii,** *DC. Prodr.* iii. 21; leaves opposite elliptic or orbicular acuminate adult glabrous beneath with tufts of yellow hair in the axils of the main nerves, racemes rusty-puberulous undivided axillary solitary and approximated almost panicled in the uppermost axils, calyx shortly constricted above the ovary then funnel-shaped or subcampanulate puberulous without. *Wall. Cat.* 3999.

NIPAL; *Wallich.* Interior of SIKKIM, alt. 4000–5000 ft. (Kulhait), *C. B. Clarke.*

A scandent shrub. *Leaves* 2–4 in., glandular-punctate on both surfaces; petiole $\frac{1}{4}$ in. *Bracteoles* minute, fugacious. *Calyx*-tube filled densely with long hairs exsert from the mouth, teeth short triangular suberect. *Petals* small, obovate. *Fruit* $\frac{3}{4}$–1 by 1$\frac{1}{4}$–1$\frac{1}{2}$ in., rich dark-brown, puberulous.—The tufts of hair are seen in *all* the axils of the nerves beneath of *C. Wallichii*, in none of *C. flagrocarpum*; also the leaves of *C. Wallichii* are smaller and thinner than those of *C. flagrocarpum*: the constricted part of the calyx-tube of *C. Wallichii* is shorter and the flower within densely filled with fulvous hair; the bracteoles are different.—As to Combretum Wallichii, *Hassk. in Flora* 1844, p. 106, and *Miq. Fl. Ind. Bat.* i. pt. i. p. 608, which these authors suggest to be allied to *C. latifolium* or *C. Wightianum*, it can only be said that as they did not possess the fruit of *C. Wallichii* it is impossible to guess to what species their remarks refer.

†† *Surface of the fruit between the wings glabrous, pubescent, or with sessile glands, but not with elongate scales.*

11. **C. squamosum,** *Roxb. Fl. Ind.* ii. 231; leaves opposite lanceolate to orbicular-elliptic acute adult glabrous, racemes lateral compound and terminal glabrous but covered with round flat glandular scales, calyx-tube shortly constricted above the ovary then funnel-shaped. *Wall. Cat.* 3987; *Miq. Fl. Ind. Bat.* i. pt. i. 607. *G. Don in Trans. Linn. Soc.* xv. 438 (*but flowers not 5-fid*); *W. & A. Prodr.* 317; *Kurz For. Fl. Brit. Burma* i. 463. C. lepidotum, *Presl Bemerk.* 142 (*see Kurz in Flora* 1871, p. 289).

NORTHERN and EASTERN BENGAL near the foot of the mountains from NIPAL to CHITTAGONG and thence to SINGAPORE; plentiful.—DISTRIB. Malaya to the Philippines.

A large scandent shrub. *Leaves* 4–6 in. from a broad base, prominently covered with flat circular glandular scales on both surfaces, those on the upper surface sometimes ultimately disappear; upper leaves usually much smaller and narrower, often lanceolate. Axillary *racemes* usually divided, panicled, but on some branches all undivided; bracteoles subulate, fugacious. *Calyx*-teeth short, triangular. *Petals* obovate, small. *Disc* and base of calyx-tube within clothed with long fulvous hairs which are not exserted. *Fruit* $\frac{1}{2}$–1$\frac{1}{2}$ in., sometimes broader than high or not; clothed between the wings with close flat round glands.

VAR. *aureum*, Wall. Cat. 3988. C. malulæa, *Wall. Cat.* 3991; same as the type, but turns a rich brown in drying.

12. **C. quadrangulare,** *Kurz in Journ. As Soc. Beng.* 1874, pt. ii. 188; leaves subopposite lanceolate or elliptic attenuated into the petiole, racemes lateral compound and terminal covered with round flat glandular scales, flowers small, calyx-tube above the ovary campanulate. C. attenuatum, *Wall. Cat.* 3989.

MOULMEIN, *Wallich.* TENASSERIM, *Helfer* No. 2181, *Kew Distrib.*

Whole plant covered with sessile flat circular scales, otherwise glabrous or nearly so. *Branchlets* quadrangular. *Leaves* 3–4 by $1\frac{1}{2}$ in. *Fruit* $\frac{1}{2}$–$\frac{3}{4}$ in.—Hardly distinguishable from *C. squamosum* Roxb. but by the small flowers and the leaves attenuated at the base. C. Van Heurckii, *Muell. in Heurck & Muell. Arg. Obs. Bot.* 227, may as far as the description goes be this plant but the fruit is not described. Griffith's No. 725 quoted cannot be found at Kew.

13. **C. dasystachyum,** *Kurz Journ. As. Soc. Beng.* 1874, pt. ii. 187; leaves opposite and often ternate elliptic- or obovate-oblong acuminate densely pubescent on the nerves beneath, racemes rarely divided axillary solitary and subterminal 2–4 together, young ovary (and calyx without) glandular and minutely pubescent, calyx-tube distinctly constricted above the ovary then funnel-shaped, fruit large.

PEGU; *Kurz.* CHITTAGONG; *Hk. f. & Th.* ASSAM; *Jenkins.* CACHAR; *Keenan.*

A scandent shrub, the innovations rusty-pubescent or villous. *Leaves* 5–10 in., lower surface puberulo-punctate, upper punctate-scabrous; petiole $\frac{1}{8}$–$\frac{3}{8}$ in., densely villous. *Racemes* in flower rusty-villous; bracteoles $\frac{1}{8}$ in., linear. *Calyx*-teeth triangular, acute, erect. *Petals* narrow obovate, small. *Disc* and base of calyx densely covered with long fulvous hair. *Fruit* $1\frac{1}{2}$ by 1 in., with scattered small round glands, otherwise glabrous.

14. **C. chinense,** *Roxb. Hort. Beng.* 28, *Fl. Ind.* ii. 230, *not of G. Don*; leaves opposite or ternate obovate or lanceolate adult glabrous, racemes undivided solitary axillary and approximated subterminal, young ovary (and calyx without) glandular and minutely pubescent, calyx-tube distinctly constricted above the ovary then funnel-shaped, fruit $\frac{3}{4}$–1 in. often bright red when ripe. *Kurz For. Fl. Brit. Burma* i. 463. C. Griffithii, *Huerck & Muell. Arg. Obs. Bot.* 231, *fide* Kurz.

TRANSGANGETIC PENINSULA from ASSAM to TENASSERIM and PENANG; alt. 0–1000 ft. frequent.—DISTRIB. China, according to Roxburgh.

A scandent shrub, nearly glabrous. *Leaves* 3–5 in., punctulate on both surfaces, the points often obscure in age; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Calyx*-teeth triangular, erect. *Petals* narrow-obovate, small. *Disc* and base of calyx within densely covered with long fulvous hair. *Fruit* about as broad as high, subglabrous.—There is no example of *C. chinense Roxb.* at Kew; Mr. Kurz has applied that name to var. *ternatum*, and the description fits well.

VAR. *ternatum, Wall. Cat.* 4002 (*sp.*); leaves often 3-nate obovate obtuse usually narrowed into the petiole, uppermost sometimes lanceolate.

VAR. 2. *Porterianum, Wall. Cat.* 4000 (*sp.*); leaves never 3-nate lanceolate or oblong distinctly acuminate.

15. **C. nanum,** *Ham. in Don Prodr.* 219; leaves opposite or all alternate from round obovate to lanceolate glabrous, racemes undivided subterminal generally few with one greatly elongated, young ovary and calyx without glabrous sparsely glandular punctulate, calyx-tube constricted above the ovary then funnel-shaped, fruit $1\frac{1}{2}$ by 1 in. or somewhat smaller puberulous or subglabrous. *DC. Prodr.* iii. 21; *G. Don in Trans. Linn. Soc.* xv. 429; *Wall. Cat.* 3994. *Brand. For. Fl.* 221.

HIMALAYA TERAI from SIKKIM to the PUNJAB; *Wallich, Royle, Edgeworth, Vicary, Strachey & Winterbottom, J. D. H.*

A decumbent low shrub, burnt down annually by the forest fires; branches 6–18 in., glabrous, the racemes minutely pubescent. *Leaves* typically 4 by $3\frac{1}{2}$ in., but often much smaller and narrower, shining, coriaceous, with scattered points on

both surfaces; petiole $\frac{1}{8}$–$\frac{3}{8}$ in. *Raceme* often subterminal and solitary, 6–7 in. with a peduncle 1–2 in.; bracteoles $\frac{3}{16}$ in., linear-spathulate. *Calyx*-teeth triangular, erect. *Petals* narrow-obovate, far exceeding the sepals. *Disc* and base of calyx within covered by long fulvous hairs.

16. **C. ovalifolium,** *Roxb. Hort. Beng.* 28, *Fl. Ind.* ii. 256; leaves opposite ovate to lanceolate glabrous or nearly so, racemes lateral much divided and terminal, young ovary and calyx without very glandular and slightly pubescent, calyx-tube shortly constricted above the ovary then widely campanulate. *W. & A. Prodr.* 317; *Wight in Hook. Bot. Misc.* iii. p. 86 *with a figure*; *Dalz. & Gibs. Bomb. Fl.* 90. C. Heyneanum, *Wall. Cat.* 4001. C. Roxburghii and C. albidum, *G. Don in Trans. Linn. Soc.* xv. 429. C. laxum, *Roxb. Fl. Ind.* ii. 230. C. Wightianum, *Thw. Enum.* 103 *in part.* C. Thwaitesianum, *Heurck & Müll. Arg. Obs. Bot.* 238.

Throughout the DECCAN PENINSULA, common; and in CEYLON.

A large scandent shrub, nearly glabrous. *Leaves* typically 4$\frac{1}{2}$ by 3 in., but often shorter and much narrower, shining, quite glabrous or more rarely with some brown hair about the base of the midrib beneath; petiole $\frac{1}{2}$ in. *Bracteoles* minute; buds subglobose, obtuse. *Calyx*-teeth triangular, acute, reflexed. *Petals* narrowly obovate, scarcely exceeding the calyx. *Disc* and base of the calyx within with much long hair. *Fruit* $\frac{3}{4}$ in. long and nearly the same in breadth, dark brown, nearly glabrous.—Mr. Thwaites has sent to Kew (under number 1601, named *C. Wightianum*) two plants, viz., *C. ovalifolium Roxb.* and *C. extensum Roxb.*; upon which Van Heurck and Müll. Arg. have founded two new species.

SECT. IV. **Quisqualoides.** *Fruit* with 4 membranous wings. *Calyx* constricted above the ovary and then produced into a cylindrical tube $\frac{1}{8}$–$\frac{1}{5}$ in., terminated by a short campanulate 4-fid limb.

17. **C. extensum,** *Roxb. Hort. Beng.* 28, *Fl. Ind.* ii. 229; leaves opposite ovate or elliptic acute glabrous or nearly so, racemes lateral rarely divided often elongate and terminal subpaniculate, young ovary (and calyx without) puberulo-pubescent, calyx-teeth triangular acuminate reflexed, buds ovate very acute. *Wall. Cat.* 3996; *G. Don in Trans. Linn. Soc.* xv. 422; *Miq. Fl. Ind. Bat.* i. pt. i. 608; *Kurz For. Fl. Brit. Burma* i. 463. C. rotundifolium, *Roxb. Fl. Ind.* ii. 226; *Wall. Cat.* 3995. C. Wightianum, *Wall. Cat.* 4007; *W. & A. Prodr.* 317; *Wight Ic.* t. 227; *Dalz. & Gibs. Bomb. Fl.* 90. C. Horsfieldii, *Miq.* l. c. 609; *Kurz in Flora* 1871, p. 289. C. platyphyllum, *Heurck & Muell. Arg. Obs. Bot.* 242; *Kurz in Journ. As. Soc.* 1874, pt. ii. 188. C. macrostachyum, *Wall. Cat.* 3997. C. latifolium, *Blume Bijd.* 641; *Miq.* l. c. 609. C. leucanthum, *Heurck & Mull. Arg. Obs. Bot.* 240. C. formosum, *Griff. Notul.* iv. 682, *fide Kurz.*—*Rheede Hort. Mal.* vii. t. 23.

DECCAN PENINSULA. CEYLON. TRANSGANGETIC PENINSULA from SILHET to SINGAPORE.—DISTRIB. Malaya.

A large scandent shrub, glabrous or nearly so. *Leaves* 4–8 (sometimes 10 in.) punctate on both surfaces when young; petiole usually short but sometimes 1 in. *Racemes* very thickly covered with flowers, sometimes short but generally elongate 4–6 in. *Calyx* with a ring of hairs at the base within, but not entirely filled by long hair. *Petals* narrow-obovate, slightly exceeding the calyx. *Fruit* 1$\frac{1}{4}$ in. and nearly as broad, puberulo-glandular or nearly glabrous.

18. **C. sundaicum,** *Miq. Fl. Ind. Bat. Suppl.* 327; leaves opposite ovate or oblong suddenly acuminate mature nearly glabrous, spikes subglobose dense in ample terminal panicles, young ovary and calyx without punctate-glandular

scarcely pubescent, calyx-teeth triangular acuminate reflexed, buds ovate very acute.

MALACCA, *Maingay* No. 1681.—DISTRIB. Sumatra.

Leaves 3–5 in., punctulate on both surfaces; petiole ⅓ in. *Calyx* with a ring of hairs at its base within but not densely filled with long hair. *Fruit* 1 in. and nearly as broad, brown, nearly glabrous.—This species so exactly coincides with *C. extensum* in its flowers and fruits that it may be doubted whether it is specifically distinct. The leaves appear smaller and thinner, and the dense heads of flowers at the ends of the branches of a large panicle give it a very different aspect.

EXCLUDED AND DOUBTFUL SPECIES.

COMBRETUM sp. 2. *Griff. Notul.* iv. 682 is probably one of the large Terminalias.

COMBRETUM (Sect. Poivrea) SEMI-ADNATUM, *Heurck & Muell. Arg. Obs. Bot.* 244; leaves ternate short-petioled elliptic acute at first simply puberulous, racemes axillary long-peduncled dense, flowers long pedicelled, bracteoles adnate to the pedicels for half their length. "In the East Indies."—This must be very distinct from all the known Indian species by its long-stalked ovary; otherwise it might be *C. trifoliatum*.

COMBRETUM OVALE, *Br.* See under 2. *pilosum*.

6. QUISQUALIS, *Linn.*

Rambling subscandent large shrubs. *Leaves* opposite, oblong or obovate, acuminate, entire. *Flowers* in short spikes, axillary and terminal, white or red. *Calyx*-tube prolonged long and slender above the ovary, deciduous; limb 5-fid. *Petals* 5. *Stamens* 10, short. *Ovary* 1-celled; style filiform, somewhat adherent to the calyx-tube, stigma subcapitate; ovules 3–4, pendulous from the apex of the cell. *Fruit* dry, coriaceous, 5-angled or 5-winged, subindehiscent. *Seed* 1, cotyledons (occasionally 3, *Kurz*) not convolute.—DISTRIB. Species 4, tropical; 3 Indian, 1 African.

Known from *Combretum Sect. Poivrea* by the elongate calyx-tube, and from *Combretum Sect. Quisqualoides* by the 5-merous flowers and the fruit.

1. **Q. indica,** *Linn. Sp. Pl.* 556; calyx-tube above the ovary 1½–2½ in., calyx-teeth triangular acute not acuminate, fruit with very sharp angles scarcely winged. *Lour. Fl. Cochinch.* 336; *Lamk. Ill.* t. 357; *DC. Prodr.* iii. 23; *Roxb. Fl. Ind.* ii. 427; *Wall. Cat.* 4010; *Wight Ill.* t. 92; *W. & A. Prodr.* 318; *Miq. Fl. Ind. Bat.* i. pt. i. 610; *Brandis For. Fl.* 220. Q. villosa, *Roxb. Fl. Ind.* ii. 426; *Spreng. Syst.* ii. 331; *DC. Prodr.* iii. 23. Q. glabra, *Burm. Fl. Ind.* t. 28. Q. pubescens, *Burm. Fl. Ind.* t. 35. Q. ebracteata, *Beauv. Fl. Owar.* t. 35. Q. Loureiri, *G. Don Gen. Syst.* ii. 667. Q. sinensis, *Lindl. in Bot. Reg. N.S.* vol. xxx. t. 15. Q. longiflora, *Presl Epimel.* 216. Quisqualis sp., *Griff. Notul.* iv. 683.—*Rumph. Herb. Amboin.* v. t. 38.

Throughout INDIA, alt. 0–1000 ft., cultivated: wild probably in the TRANSGANGETIC PENINSULA.—DISTRIB. Cultivated generally in the tropics, wild in Malaya.

Leaves 4 in., nearly glabrous or in var. *villosa* shortly pubescent beneath; petiole ⅛–¼ in., rusty villous as are the innovations. *Spikes* somewhat dense; bracteoles ⅓ in., usually lanceolate, but variable, generally subpersistent. *Petals* rose or scarlet, oblong or nearly round. *Fruit* ¾–1¼ by scarcely ½ in., glabrous, black, very acute at the top.

2. **Q. densiflora,** *Wall. Cat.* 4011; tube of the calyx above the ovary ½–¾ in., calyx-teeth lanceolate-subulate, fruit distinctly winged. *Miq. Fl. Ind. Bat.* i. pt. i. 611. S. confertum, *Jack in Hook. Comp. Bot. Mag.* i. 155; *Miq.* l. c. 611.

PENANG; *Wallich.* MOULMEIN; *Falconer.* MALACCA; *Griffith.* SINGAPORE; *Lobb.*

Leaves 4–6 in., nearly glabrous; petiole ¼–½ in., rusty-pubescent. *Spikes* dense, fulvo-pubescent; bracteoles ½–¾ in., lanceolate, pubescent, subpersistent. *Petals* less than ¼ in., scarlet. *Fruit* 1 by ⅝ in., shining, quadrangular, oblong; the wings narrow but distinct, papery.—This species seems congeneric with *Combretum pilosum* above.

3. **Q. malabarica,** *Bedd. Ic. Pl. Ind. Or.* t. 155; calyx-tube above the ovary ⅜ in., calyx-teeth lanceolate-subulate, petals ½ in. and more.

DECCAN PENINSULA; Carcoor Ghat, Wynaad, alt. 1500 ft., *Beddome.*

A large climber, nearly glabrous, the petioles becoming permanent as rigid spines. *Leaves* 4–5 in.; petiole ⅜ in., glabrous. *Spikes* somewhat few-flowered, minutely grey-puberulous or pubescent; bracteoles ⅕ in., linear. *Petals* pink. *Fruit* unknown. —Much more glabrous than *Q. densiflora*, the bracteoles much smaller, the petals much longer.

7. ILLIGERA, *Blume.*

Scandent shrubs. *Leaves* alternate, petioled, with three entire petioluled leaflets. *Flowers* in elongate lax peduncled cymes; bracteoles 1–3 at the base of each flower. *Calyx*-tube shortly constricted above the ovary; limb of 5 valvate oblong deciduous lobes. *Petals* 5, valvate, oblong, alternate with and as long as the calyx-lobes. *Stamens* 5, epigynous, filament near the base carrying on each side a staminode; anthers dehiscing by lateral valves. *Ovary* 1-celled; style 1, filiform, ending in a dilated undulate sinuated stigma; ovule 1, pendulous from the apex of the cell. *Fruit* broadly 2–4-winged (2-winged in the Indian species known) the wings veined. *Seed* with plane-convex (not convoluted) cotyledons.—DISTRIB. Species 7 or 1, extending from Khasia to Singapore, Malaya and the Philippines: and one aberrant species in Angola having 5 leaflets.

1. **I. Coryzadenia,** *Meissn. in DC. Prodr.* xv. pt. i. 251; leaflets pubescent on the nerves beneath fulvo-pilose on the midrib above punctate at least while young, staminodes sub-petaloid hooded and enfolded not emarginate. I. appendiculata, *Blume*; *Kurz For. Fl. Brit. Burma* i. 469. Coryzadenia trifoliata, *Griff. Notul.* iv. 356.

MERGUI; *Griffith.* TENASSERIM, *Helfer* (Kew Distrib. No. 4341 partly). ANDAMANS; *Kurz.*

Stem striate, nearly glabrous. *Petiole* 2–4 in. petiolules ⅛–1 in. (variable as in most of the species), more or less fulvo-pilose; leaflets 2–4 in., oblong or broad-elliptic, suddenly acuminate, usually cordate at base but sometimes acute; the lower leaves often much larger and their leaflets nearly orbicular. *Cymes* often 6–8 in.; bracteoles minute, ovate, and the calyx without minutely pubescent. *Fruit* 1 by 2¼ in. including the wings, softly minutely pubescent.—Kurz (*in Journ. As. Soc.* 1877, pt. ii. 59) unites the two species of Meissner, viz., *I. Coryzadenia* and *I. appendiculata.*

2. **I. Kurzii,** *C. B. Clarke*; leaflets glabrous epunctate very coriaceous with an incurved cartilaginous margin, staminodes subpetaloid hooded and enfolded not emarginate, fruit 2¼–3½ in. wide 2-winged.

BURMA (Karens); *Kurz.* Mikir Hills, KHASIA; *Simons.* TENASSERIM; *Helfer* (Kew Distrib. No. 4341) partly. MALACCA, *Maingay* No. 649, 650.

Stem striate, nearly glabrous. *Petiole* 2–5 in.; petiolules $\frac{1}{8}$–1 in.; leaflets elliptic-lanceolate, those from the lower stem broader sometimes nearly orbicular. *Cymes* often 6–8 in.; bracteoles very small, ovate, and as the calyx without minutely pubescent. *Fruit* 1 in. long, the wings brown nearly glabrous with horizontal striations. —If Meissner's species are united as proposed by Mr. Kurz, this must be regarded as a variety.

3. **I. Khasiana,** *C. B. Clarke*; leaflets glabrous with tufts of long yellow hairs in the nerve-axils beneath and sometimes minutely setose on the midrib on the upper surface, staminodes not petaloid concave deeply emarginate, fruit $2\frac{1}{4}$ in. wide (not quite ripe) 2-winged.

KHASIA; *Griffith* (Kew Distrib. No. 4340); Churra, alt. 3000–4000 ft., *J. D. H. & T. Thomson*; Likinsow, 2500–3000 ft., *C. B. Clarke.*

Stem striate, nearly glabrous. *Petiole* 2–5 in.; petiolules $\frac{1}{8}$–1 in.; leaflets elliptic-lanceolate (no lower leaves preserved). *Cymes* often 6–10 in.; bracteoles very small, ovate, and as the calyx without minutely pubescent. *Fruit* 1 in. long and more, the wings brown nearly glabrous with horizontal striations.

DOUBTFUL SPECIES.

I. OBTUSA, *Meissn. in DC. Prodr.* xv. pt. i. 251 founded on Wight's Herb. No. 394 is said to have drupes 5 lines long 4 lines thick, and therefore cannot belong to the genus *Illigera* as at present defined. There is no example in the Kew Herbarium of any *Illigera* from the Deccan Peninsula.

8. GYROCARPUS, *Jacq.*

A tall tree. *Leaves* alternate, long petioled, large, entire or lobed, clustered towards the ends of the branches. *Flowers* small, unisexual, very numerous, clustered in large branched cymes without bracts. MALE flowers very numerous; calyx 4–7-partite; petals 0; stamens 4–7, inserted at the base of the calyx with as many alternate clavate glands, anthers dehiscing by valves; ovary 0. FEMALE or hermaphrodite flowers few; calyx-tube adherent to the ovary, limb 2-partite, persistent, enlarging in fruit; petals and stamens 0; ovary 1-celled; style 0, stigma sessile; ovule solitary pendulous from the apex of the cell. *Nut* bony, crowned by the elongate spathulate coriaceous calyx-lobes. *Seed* with convolute cotyledons.

1. **G. Jacquini,** *Roxb. Hort. Beng.* 11, *Cor. Pl.* t. 1, *Fl. Ind.* i. 445; *Lamk. Ill.* t. 850; *Bedd. Fl. Sylv.* t. 196; *Kurz For. Fl. Brit. Burma* i. 470. G. asiaticus, *Willd. Sp. Pl.* iv. 982; *Wall. Cat.* 968; *Miq. Fl. Ind. Bat.* i. pt. i. 978; *DC. Prodr.* xv. pt. i. 248. G. americanus, *Jacq. Pl. Amer.* t. 178. G. acuminatus, *Meissn. in DC. Prodr.* xv. pt. i. 248. G. sphenopterus and G. rugosus, *R. Br. Prodr.* 405.

DECCAN PENINSULA, alt. 0–1000 ft., frequent. BENGAL, rare. MALAY PENINSULA, frequent.—DISTRIB. The tropics of the whole world near the sea.

Attains 60–80 ft. (Kurz). *Leaves* (of full-grown trees) 4–5 in. and as broad, broadly ovate, acuminate, entire, generally glabrous, those of young plants often very large deeply lobed and more or less pubescent. *Peduncles* 1–3 in., in the upper axils. *Drupes* $\frac{1}{2}$–$\frac{3}{4}$ in., ovoid; calyx-lobes 2–3 in.

ORDER LIX. **MYRTACEÆ.** (By J. F. Duthie, F.L.S.).

Trees or shrubs, rarely herbs. *Leaves* opposite, seldom alternate or whorled, petioled, simple, entire, rarely denticulate or crenate, 3-nerved or pinnately-nerved and usually with an intramarginal nerve, generally coriaceous and dotted with pellucid glands. *Stipules* if present small and deciduous. *Flowers* regular, very rarely irregular, hermaphrodite or polygamous by arrest, axillary, solitary or in spikes cymes corymbs or heads, naked or with an involucre, often with 2 bracts at the base, white, pink, purple, or yellow, never blue. *Calyx* superior or ½-superior, limb 4–5–many-fid or -partite, persistent or deciduous, valvate or imbricate, sometimes entire or closed in bud. *Petals* inserted on a disk surrounding the cavity of the calyx, equal in number to the calyx-lobes and alternate with them, rarely 0. *Stamens* usually ∞, inserted with the petals in several rows, rarely definite and alternate with the petals; filaments free or more or less coherent at the base or in bundles opposite the petals; anthers small roundish with parallel cells bursting longitudinally. *Ovary* inferior or ½-inferior, crowned by a fleshy disk, 1-celled with 1 or more ovules, or 2–many-celled with ∞ ovules; placentation axile (parietal in *Rhodamnia*); style terminal rarely lateral, smooth or bearded at the summit; stigma undivided. *Fruit* usually crowned with the calyx-limb, either 1-celled and 1-seeded by arrest, or 2–many-celled with loculicidal or septicidal dehiscence; or baccate and indehiscent with the cells many-seeded or 1-seeded by arrest. *Seeds* angular cylindric or compressed; testa hard or membranous, sometimes winged; albumen 0; embryo straight curved or spirally twisted, cotyledons usually short and obtuse sometimes combined into a mass with the radicle, very rarely leafy, radicle often thick close to the hilum.—DISTRIB. Tropical and subtropical regions of both hemispheres; species upwards of 1800.

Species of the Australian genus *Eucalyptus* are being successfully cultivated on the Nilghiri hills and in other parts of India. The common Myrtle (*Myrtus communis*, L.) is extensively grown in India, the leaves being used in native medicine; it extends from the Mediterranean region as far as Afghanistan and Beluchistan. Allspice (*Pimenta acris*, Wight), a West Indian tree, is much cultivated for the sake of its aromatic leaves and berries.

Glaphyria sericea, Jack. in Trans. Linn. Soc. xiv. 128, from Penang, may be a species of *Leptospermum* by description only. *Myrtus androsæmoides*, Poir. is *Myonima multiflora*, Ait. A native of Mauritius. *Hiræa Finlaysoniana*, Wall. Cat. 3566 F. is *Decaspermum paniculatum*, Kurz.

A. Fruit capsular.

TRIBE I. **Leptospermeæ.** *Ovary* 2–5-celled. Fruit opening by as many valves.

Leaves narrow.
- Stamens definite (10 or fewer) free, in one series. Leaves alternate. Flowers few or solitary in the axils . . . . 1. BÆCKEA.
- Stamens ∞, free, in one series. Leaves alternate. Flowers few or solitary in the axils . . . . 2. LEPTOSPERMUM.
- Stamens ∞, slightly combined below into bundles opposite the petals and exceeding them. Flowers in heads or spikes . . . . 3. MELALEUCA.

Leaves broad. Stamens ∞, united into 5 bundles opposite the petals. Flowers in axillary cymes . . . . 4. TRISTANIA.

B. Fruit fleshy.

TRIBE II. **Myrteæ.** *Ovary* 2- or more-celled (except *Rhodamnia*). *Fruit* a berry or drupe.

Limb of calyx closed in bud with the lobes subimbricate, rather deeply valvately divided when in flower . . . . . *4. PSIDIUM.
Limb of calyx 4-5-lobed or -partite in bud, not becoming further divided when in flower.
 Ovary 1-celled with 2 parietal placentas. Leaves 3-nerved . . . . 5. RHODAMNIA.
 Ovary 1-3-celled with double rows of ovules in each cell separated by spurious partitions. Leaves sometimes 3-nerved . . . . 6. RHODOMYRTUS.
 Ovary 5- rarely 4-celled with 2-6 ovules in each cell. Embryo long and narrow, curved, circular, or spiral, with small cotyledons . . . . 7. DECASPERMUM.
 Ovary 2-3-celled with several ovules in each cell and without spurious partitions. Embryo thick and fleshy, not divisible, or with 2 thick fleshy cotyledons and a short radicle . . . . 8. EUGENIA.

TRIBE III. **Lecythideæ** (Sub-tribe Barringtonieæ). *Ovary* 2- or more-celled. *Fruit* indehiscent, hard and fibrous or fleshy. *Leaves* alternate, not gland-dotted.

Stamens all perfect. Fruit angular, fibrous, 1-seeded . . 9. BARRINGTONIA.
Outer or inner stamens or both without anthers. Fruit ovoid or globular, fleshy, many-seeded . . . . 10. CAREYA.

1. **BÆCKEA,** *Linn.*

Glabrous heath-like shrubs. *Leaves* opposite, narrow, pointed, with many pellucid glands. *Flowers* normally 5-merous, axillary, peduncled, with 2 minute bracts at their base. *Calyx-tube* campanulate; lobes 5, membranous, persistent. *Petals* 5, suborbicular. *Stamens* 10 or fewer, shorter than the petals. *Ovary* inferior or ½-inferior, 2-3-celled, with several ovules in each cell. *Capsule* bursting from above loculicidally. *Seeds* angular; embryo straight with short cotyledons.—DISTRIB. Species about 50, the greater number Australian, a few in New Caledonia, one only extending into India.

1. **B. frutescens,** *Linn.*; leaves linear pointed ascending or spreading, flowers axillary shortly peduncled, calyx-lobes roundish petaloid, stamens 10 rarely 8, ovary 3-celled. *DC. Prodr.* iii. 229; *Sm. in Trans. Linn. Soc.* iii. 260; *Bot. Mag.* t. 2802; *Blume Mus. Bot.* i. 69; *Miq. Fl. Ind. Bat.* i. pt. i. 406; *Benth. Fl. Hongk.* 118. B. Cumingiana, *Schauer in Walp. Rep.* ii. 920. B. chinensis, *Gaertn. Fruct.* i. 157, t. 31.—*Osbeck Itin.* 231, t. 1.

Eastern Peninsula; MALACCA, *Griffith, Maingay, Cuming, Lobb, Low.*—DISTRIB. Sumatra, Borneo, Philippines, S. China.

A slender shrub with rod-like branches. *Leaves* small, ¼-½ in. long, flat or somewhat channelled above, convex beneath. *Peduncles* usually solitary and short with 2 minute bracts at the base. *Flowers* small, white, 5-merous, occasionally 4-merous. *Calyx-tube* campanulate.

2. **LEPTOSPERMUM,** *Forst.*

Shrubs, rarely small trees, glabrous or silky-pubescent. *Leaves* alternate, entire, rigid, with 1–3 nerves or nerveless. *Flowers* solitary in the axils of the leaves, or 2–3 together at the ends of the branches, rarely peduncled, sometimes polygamous; bracts broad, scarious, often imbricate, the lower ones soon falling off. *Calyx-tube* broadly campanulate or turbinate, adnate to the ovary below, the free upper part broad; lobes 5. *Petals* 5, spreading. *Stamens* ∞, in a single series, not longer than the petals; anthers versatile, their parallel cells bursting longitudinally; connective swollen, gland-like. *Ovary* inferior or ½-inferior, enclosed in the calyx-tube, 5- or more-celled, rarely 3- or 4-celled; style filiform, inserted in a deep depression of the ovary, sometimes short, stigma capitate or peltate. *Capsule* usually exceeding the calyx-tube, opening loculicidally from above. *Seeds* ∞, linear or winged, often sterile; embryo straight.—DISTRIB. Species upwards of 25, chiefly Australian, a few in New Zealand and New Caledonia.

1. **L. amboinense,** *Blume Bijd.* p. 1100; *Mus. Bot.* i. 68; glabrous or silky on the young parts, leaves linear-lanceolate or obovate obtuse, flowers sessile or nearly so solitary terminal or axillary, ovary 5-celled. *DC. Prodr.* iii. 229; *Miq. Fl. Ind. Bat.* i. pt. i. 404. L. flavescens, *Sm. in Trans. Linn. Soc.* iii. 262; *DC. Prodr.* iii. 227; *Bot. Mag.* 2695; *Benth. Fl. Austral.* iii. 104, *var. a.* Macklottia amboinensis, *Korth. in Ned. Kruidk. Arch.* i. 196.—Myrtus amboinensis, *Rumph. Herb. Amb.* ii. 77, t. 18.

MALACCA; *Griffith, Maingay, Low.*—DISTRIB. Indian Archipelago, and from Queensland to Tasmania.

A shrub. *Leaves* 1 in. and smaller, 1–3-nerved or the nerves indistinct, narrowly or broadly oblong or even obovate. *Flowers* sometimes ½ in. across. *Calyx* glabrous, tube broadly campanulate; lobes rather shorter than the tube. *Anthers* attached to a purplish gland-like connective. *Ovary* glabrous, prominent above the calyx-tube, and with a central depression round the style.

2. **L. javanicum,** *Blume Bijdr.* 1100; *Mus. Bot.* i. 68; leaves lanceolate obtuse obscurely 3-nerved tipped with a deciduous mucro, ovary 5-celled. L. floribundum, *Jungh. Java* i. 578. Macklottia javanica, *Korth. Ned. Kruidk. Arch.* (1847), 196.

MOULMEIN; exposed rocks, alt. 5000 ft., *Lobb.*—DISTRIB. Java, Sumatra?

A shrub, ½–1 ft. high. *Leaves* ½–1 in. by ¼ in., narrowly obovate with silky hairs on the edges and beneath, midrib prominent beneath, lateral nerves soon vanishing upwards. *Flowers* about ½ in. across, few or solitary, axillary. *Calyx-lobes* ovate, obtuse, membranous, deciduous. *Anthers* attached to a dark-coloured gland-like connective. *Style* about ⅛ in.; stigma capitate. *Capsule* 5-celled, smooth, smaller than in Miquel's specimens from Java.

3. **MELALEUCA,** *Linn.*

Trees or shrubs. *Leaves* alternate, rarely opposite, entire, lanceolate or linear, flat or subterete, 1–3-many-nerved. *Flowers* in heads or spikes, each sessile in the axil of a floral leaf, 5-merous; bracts deciduous. *Calyx-tube* subglobose; lobes 5, imbricate or open. *Petals* 5, spreading, deciduous. *Stamens* ∞, more or less united at their bases into 5 bundles opposite the petals; anthers versatile, the cells parallel and bursting longitudinally. *Ovary* infe-

rior or ½-inferior, enclosed in the calyx-tube, usually with many ovules in each cell. *Capsule* opening loculicidally from above by 3 valves. Perfect *seeds* cuneate; embryo straight, cotyledons longer than the radicle.—DISTRIB. Upwards of 100 species, all Australian, one of them extending into Tropical Asia.

1. **M. Leucadendron,** *Linn.*; leaves alternate elliptic or lanceolate straight oblique or falcate 3–7-nerved with anastomosing nerves, spikes long interrupted solitary or 2 or 3 together terminal at first and then surmounted by leafy branches, rachis and calyx glabrous or woolly. *Benth. Fl. Austral.* iii. 142; *Kurz in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 61; *For. Fl. Brit. Burm.* i. 472.

TENASSERIM and MERGUI, *Griffith*; MALACCA, *Maingay*, *Cuming*.—DISTRIB. Malay Islands to Australia.

A tree, often of large size, with a thick spongy bark peeling off in layers, and pendulous branches; or stunted and with stiff erect branches. *Leaves* often vertical, acuminate acute or obtuse, narrow and 6–8 in., or broader more rigid and 2–4 in. *Flower-spikes* 2–6 in. *Calyx-tube* ovoid; lobes roundish and often scarious at the margin. *Petals* ⅛ in. *Staminal bundles* under ½ in., each with 5–8 filaments. *Ovules* ∞, ascending, attached to an oblong placenta. *Fruiting-calyx* about ⅙ in. in diam. *Seeds* obovoid or cuneate; cotyledons obovate, thick, much longer than the radicle.

The following are the principal varieties of this species, concerning which Mr. Bentham remarks (Fl. Austral. iii. 142):—"This species, very widely spread and abundant in the Indian Archipelago and Malayan Peninsula, varies exceedingly in the size, shape and texture of the leaves, in the young shoots very silky-villous or woolly, or the whole quite glabrous; in the short and dense or long and interrupted spikes; in the size of the flowers; in the greenish-yellow, whitish, pink or purple stamens, etc., and at first sight it is difficult to believe that they all can be forms of one species; but on examination none of these variations are sufficiently constant or so combined as to allow of distinct races."

VAR. *Leucadendron*; spikes glabrous. *Linn. Mant.* 105 and *Suppl.* 342; *Lour. Fl. Cochinch.* 468; *Roxb. Fl. Ind.* iii. 397; *DC. Prodr.* iii. 212; *Wall. Cat.* 3646; *Blume Mus. Bot.* i. 66; *Miq. Fl. Ind. Bat.* i. pt. i. 401. Myrtus Leucadendron, *Linn.*—*Rumph. Herb. Amb.* ii. 72, tt. 16, 17, f. 1.—Cultivated in India.

VAR. *minor*; spikes villous. M. minor, *Sm. in Rees. Cycl.* 23; *DC. Prodr.* iii. 212; *Wall. Cat.* 3645; *Blume Mus. Bot.* i. 67; *Miq. Fl. Ind. Bat.* i. pt. i. 403. M. Cajuputi, *Roxb. Fl. Ind.* iii. 394: *W. & A. Prodr.* 326; *Miq. l. c.* 403. M. Leucadendron, *Lam. Encycl.* 641. M. viridiflora, *Gærtn. Fruct.* i. 173, t. 35; *DC. Prodr. l. c.*; *Wall. Cat.* 3647. M. saligna, *Blume Mus. Bot.* i. 66. M. Cumingiana and lancifolia, *Turcz. in Bull. Soc. Mosc.* xx. 164. Myrtus saligna, *Gmel. Syst.* 793.—*Rumph. Herb. Amb.* ii. 76.—This appears to be the plant from which the Cajuput-oil of commerce is chiefly obtained.

Miquel (Fl. Ind. Bat. l. c.) describes *M. Cumingiana* as specifically distinct, distinguishing it from *M. lancifolia* by the absence of auricles to the staminal bundles; the existence of these however in the latter does not appear to be evident. Mr. Bentham (Fl. Austral. l. c.) considers that both of them belong to one of the common Archipelago forms with twin leaves and small flowers.

4. **TRISTANIA,** *R. Br.*

Tall shrubs or trees. *Leaves* alternate or crowded at the summit of the branches, rarely opposite. *Flowers* small, yellow or white, arranged in axillary cymes; bracts deciduous or 0. *Calyx-tube* turbinate campanulate or open, attached below to the ovary; lobes 5, imbricate in æstivation, persistent. *Petals*

5, spreading. *Stamens* ∞, shorter than the petals, usually united in 5 bundles and opposite to them; anthers versatile, cells parallel and opening longitudinally. *Ovary* inferior or ½-superior, 3-celled; ovules many in each cell, suspended or horizontal. *Capsule* loculicidally 3-valved. Perfect *seeds* few, linear, cuneate, or winged at the upper part; embryo straight, cotyledons broad, longer than the radicle.—DISTRIB. Upwards of 14 species inhabiting the Malay peninsula and islands, New Caledonia, and Australia.

1. **T. Wightiana,** *Griff. MSS.*; leaves alternate shortly petioled oblanceolate acuminate glabrous closely pinnate-nerved, cymes corymbose dichotomous long peduncled terminal and axillary equalling or exceeding the leaves, branches angular pubescent, bracts leaflike, flowers small on short pedicels, staminal bundles 3-androus, capsule very small almost wholly exserted, seeds narrow compressed winged. T. sumatrana, *Miq. Fl. Ind. Bat. Suppl.* 308. Hypericinea pimentifolia, *Wall. Cat.* 4828.

MALACCA, *Griffith*; SINGAPORE, *Wallich, Lobb*; PENANG, *Walker*.—DISTRIB. Java, Sumatra, Borneo.

A shrub. *Bark* reddish-brown. *Leaves* 4½–6 by 2–2½ in., gradually narrowing towards the base, obtusely acuminate or cuspidate, shining above, dull and tawny-coloured beneath, margins revolute, lateral nerves slender uniting in a continuous intramarginal one. Primary and secondary branches of inflorescence very long. *Calyx-tube* broadly campanulate above, spreading or reflexed in fruit, its inner surface and the ovary clothed with pure white pubescence. *Petals* nearly round, glandular. *Style* short. *Seeds* 4–5 in each cell.

2. **T. burmannica,** *Griff. MSS.*; leaves alternate or crowded at the ends of the branches shortly petioled oblong-lanceolate obtuse or obtusely acuminate glabrous or tomentose, cymes axillary few-flowered much shorter than the leaves branches angular pubescent, flowers small yellowish on short pedicels 2 or 3 together with linear bracts at the base, calyx-lobes sub-acute, staminal bundles about 5–7-androus, capsule exserted about ⅔ its length, seeds ⅛ in. long winged. *Kurz in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 61; *For. Fl. Brit. Burm.* i. 474. "Tristaniæ facie," *Griff. Notul.* 648. Hypericinea micrantha, *Wall. Cat.* 4829.

TENASSERIM, *Helfer*; MOULMEIN and MALACCA, *Falconer, Griffith, Wallich*; PEGU, *Kurz*.—DISTRIB. Java and Borneo.

A shrub upwards of 8 ft. *Bark* grey. Young parts and upper branches of inflorescence pubescent. *Leaves* 2–4 by ⅔–1⅔ in., shining above, lighter below or rusty-coloured, coriaceous, margins revolute, dots inconspicuous, lateral nerves slender, prominent, uniting in a continuous looping one near the margin; petiole ¼ in. or less. *Cymes* compact, dichotomous. *Petals* nearly round, shining. *Ovary* silky-pubescent; ovules many, suspended. *Capsule* ⅛ in. *Seeds* compressed.

VAR. *tomentosa*; leaves ochre-coloured hairy on both surfaces towards the base and along the prominent midrib, cymes nearly sessile compact and densely clothed with yellow tomentum, flowers larger and calyx-tube broader above, style longer, stigma capitate, young capsule rugose pubescent, seeds about 4 in each cell.—"A small tree." Tenasserim mountains, 4000 ft., *C. Parish*. There are no ripe capsules on the single specimen preserved in the Kew Herbarium. Possibly a distinct species.

VAR.?; leaves longer (2–5 in.), cymes lax, peduncles ¾ in., the capsules and seeds however are similar to those of Wallich's *Hypericinea micrantha*; there are no flowers on this specimen.—Near Moulmein, alt. 1000 ft., *C. Parish*.

3. **T. merguensis,** *Griff. in Journ. As. Soc. Beng.* 1854, 637; leaves alternate or the upper nearly opposite very shortly petioled or sessile obovate-lanceolate obtuse or obtusely acuminate glabrous, panicles on long peduncles, branches angular pubescent above, bracts leaflike, calyx-lobes oblong rounded

at the apex, staminal bundles 6–10-androus, capsule roundish large exserted nearly $\frac{1}{2}$ in., seeds compressed. *Kurz For. Fl. Brit. Burm.* i. 473. "Tristaniæ affinis," *Griff. Notul.* 650; *Ic. Pl. Asiat.* t. 636, f. 3. Melaleuca eugeniifolia, *Wall. Cat.* 3648. M. decurrens, *Wall. Cat.* 3649.

MERGUI, *Griffith*; TENASSERIM OR ANDAMAN ISLANDS, *Helfer*; MALACCA, *Finlayson, Wallich*; Mount Ophir, *Griffith*.—DISTRIB. Borneo. Cap. Rochardo, *Wallich*.

A tree with pendent branches. *Leaves* 2–7 by $2\frac{1}{4}$ in., gradually narrowing towards the base, often retuse at the apex, pinnate-nerved, rusty red beneath, darker above and punctate. Branches of the *inflorescence* compressed, angular, furrowed, upper part together with the bracts and calyx covered with stiff whitish hairs. *Calyx-tube* rather less than $\frac{1}{8}$ in., broadly campanulate in fruit, its nearly truncate limb spreading or reflexed; lobes obtuse. *Petals* small, transversely oblong with a minute claw at the base. *Filaments* hairy below. *Ovary* pilose; style rather long, stigma slightly capitate; ovules ∞, pendulous from the apex of the cells. Valves of the *capsule* transversely wrinkled externally. *Seeds* about 8 in each cell, compressed, $\frac{1}{4}$ in. long.—Griffith remarks that the flowers are white and disagreeably scented. In Wallich's *M. decurrens* the blade of the leaf extends to the base, and the leaves are less conspicuously dotted.

4. **T. Maingayi,** *Duthie*; leaves alternate shortly petioled narrowly oblanceolate attenuated at each end obtuse coriaceous glabrous, cymes chiefly from the upper leaf-axils, branches compressed or angular pubescent, flowers sessile 3–4 together, staminal bundles 5–11-androus, capsule rather large about $\frac{1}{3}$ in roundish exserted $\frac{1}{4}$ its length, seeds winged 9–10 in each cell.

MALAYA, *Maingay*; Kew Distrib. 767 in part.

Leaves $1\frac{1}{2}$–$2\frac{1}{2}$ by $\frac{1}{2}$–$\frac{3}{4}$ in., dark and polished above, rusty-yellow beneath, dotted, margins slightly revolute, nerves not prominent. *Cymes* dichotomously branched; peduncles $\frac{1}{2}$–$1\frac{1}{2}$ in.; pedicels and calyx covered with light yellow tomentum, lobes rounded at the apex or subacute. *Petals* small, transversely oblong or orbicular, hairy outside. *Filaments* hairy below. *Ovary* pubescent with white hairs. *Capsules* $\frac{1}{3}$ in. in diam.

5. **T. Griffithii,** *Kurz in Pegu Rep. Append. B.* p. 50; leaves crowded towards the ends of the branches lanceolate attenuated at both ends, cymes subaxillary few-flowered, flowers rather large white, capsule scarcely exserted, seeds winged. *Kurz in Journ. As. Soc. Beng.* xlvi. pt. ii. p. 61; *For. Fl. Brit. Burm.* i. 474. T. conferta, *Griff. Notul.* p. 649; *not of R. Br.*

MERGUI, *Griffith*; PEGU, *Kurz*.

A shrub. *Leaves* coriaceous, pellucid-punctate. Terminal *buds* with imbricating membranous scales. *Calyx-tube* turbinate; lobes 5, ovate, acuminate, falling off circumscissly at the apex of the fruit. *Petals* round. *Filaments* nearly equal to the petals. *Style* filiform, shorter than the stamens; stigma capitate.—I have not seen specimens.

4*. PSIDIUM, *Linn.*

Trees or shrubs. *Leaves* opposite, entire, not dotted. *Peduncles* 1- few-flowered; flowers large, white. *Calyx* urceolate or obovate; limb undivided in æstivation, separating valvately into 4–5 lobes when in flower. *Petals* 4 or 5, free. *Stamens* ∞. *Ovary* 2- or more-celled with many ovules in each cell. *Berry* many-seeded. *Seeds* with hard testa; embryo curved, radicle long, cotyledons short.—DISTRIB. Tropical and subtropical America; about 100 species have been enumerated.

1. **P. Guyava,** *Linn.*; *Benth. Fl. Hongk.* 120; *Brandis For. Fl.* 232; *Griseb. Fl. Brit. West. Ind.* 241; *Kurz in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 62; *For. Fl. Brit. Burm.* l. 476.

Naturalised throughout India.

A small tree, pubescent on the young branches. *Leaves* on very short petioles, ovate or oblong, and usually acuminate, 3–4 in. long, glabrous or nearly so above, softly pubescent beneath and with the principal nerves prominent. *Peduncles* axillary, ½ in., 1–3-flowered; buds ovoid in the adnate part, the free part also ovoid but larger and more or less pointed. *Petals* broad, ½ in. in diameter. *Fruit* globose or pear-shaped.—"Indigenous in Mexico and possibly in other parts of Tropical America, cultivated and naturalised in most tropical countries. In India the Guava is cultivated almost everywhere except in the north-western corner of the Punjab. It often run wild, but there is no ground for supposing that the Guava is indigenous in India. Wood compact, close-grained, takes a beautiful polish." (*Brandis l. c.*)

VAR. *pyriferum*, Linn. (sp.); peduncles 1-fld, fruit pyriform. *Roxb. Fl. Ind.* ii. 480.

VAR. *pomiferum*, Linn. (sp.); peduncles usually 2–3-fld, fruit globose or ovoid. *Roxb. Fl. Ind.* ii. 480.

5. RHODAMNIA, *Jack.*

Shrubs or small trees. *Leaves* opposite, 3-nerved, hoary or pubescent beneath. *Flowers* rather small, pedicels short, sometimes very shortly fasciculate or in lax racemes; bracteoles small, deciduous. *Calyx-tube* ovoid or subglobose, not produced beyond the ovary; segments 4, persistent. *Petals* 4, spreading. *Stamens* ∞, in many series, free; filiments filiform; anthers versatile with parallel cells dehiscing longitudinally. *Ovary* 1-celled with parietal placentation and many ovules; style filiform, stigma peltate. *Berry* globose, crowned with the limb of the calyx. *Seeds* few, reniform, globose or variously compressed, testa hard; embryo horseshoe-shaped, radicle long, cotyledons very short.—DISTRIB. About 12? species; 3 in Australia, and the rest natives of Tropical Asia.

1. **R. trinervia,** *Blume Mus. Bot.* i. 79; leaves ovate-oblong or ovate-lanceolate acuminate glabrous or more or less reticulate above prominently 3-nerved from the base often silvery-pubescent beneath, peduncles slender axillary 1- rarely 3-fl. with minute bracteoles under the calyx, berry globose reddish. *Kurz in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 63; *For. Fl. Brit. Burm.* i. 474; *Benth. Fl. Austral.* iii. 278. Myrtus trinervia, *Sm. in Linn. Trans.* iii. 280. Eugenia? trinervia, *DC. Prodr.* iii. 279; *Bot. Mag.* 3223.

TENASSERIM, *Helfer*; MALACCA, *Cuming, Griffith*; SINCAPORE and PENANG, *Walker, Wallich*; NICOBAR ISLANDS, *Kurz.*—DISTRIB. Malay Islands and Philippines to Australia.

A small tree or shrub with greyish wrinkled bark and pilose branchlets, young parts and inflorescence often densely silky. *Leaves* variable in size, 4–6 by 1¼–2½ in., sometimes rugose beneath, shortly petioled, subacute at the base. *Peduncles* varying in length, shorter than the leaves. *Flowers* white, fragrant. *Petals* twice as long as the calyx-lobes, hairy outside. *Stamens* nearly as long as the petals. *Berry* about ⅓ in. in diam.—I have adopted Mr. Kurz's nomenclature who includes the various forms under the following varieties.

VAR. *concolor*; leaves green on both surfaces, sparingly pubescent, peduncles 4–7- or fewer-flowered. R. cinerea, *Griff. Notul.* 653, *not of Jack.*; *Kurz in Journ. As. Soc.* l. c. R. concolor, *Miq. Fl. Ind. Bat. Suppl.* i. 315. Myrtus smilacifolia, *Wall. Cat.* 3629.

VAR. *spectabilis*; leaves silvery-white beneath or greyish when old, flowers usually

fewer 2 or solitary. R. spectabilis, *Blume Mus. Bot.* i. 78; *Miq. l. c.* 479; *Kurz l.c.* R. cinerea, *Jack in Mal. Misc.* Monoxora spectabilis, *Wight Ill.* ii. 12, t. 97*, f. 5. R. Nageli, *Miq. l.c.* R. subtriflora and R. Mulleri, *Bl. l.c.* 79.

6. RHODOMYRTUS, *DC.*

Trees or tomentose shrubs. *Leaves* opposite, 5- or 3-nerved. *Flowers* rather large, axillary. *Calyx-tube* turbinate, oblong or subglobose, hardly produced above the ovary; lobes 5 rarely 4, herbaceous, persistent. *Petals* 5, rarely 4, spreading. *Stamens* ∞, free, in many series. *Ovary* 1- 2- 3-celled with spurious partitions, or divided into numerous 1-ovuled superposed cells; style filiform, stigma capitate. *Berry* drupelike, globose or ovoid, with few or numerous seeds not distinctly superposed in rows. *Seeds* compressed, reniform or nearly orbicular, horizontal, testa hard; embryo curved or spiral, radicle very long, cotyledons small.—DISTRIB. 5 species, 4 of them inhabitants of E. Australia, and 1 widely distributed over Tropical Asia, especially throughout the Indian Archipelago as far as China.

1. **R. tomentosa,** *Wight Spicil. Neilgh.* i. 60, t. 71; branches downy above slightly compressed, leaves elliptic or obovate obtuse shortly petioled 3-nerved hoary on the underside with soft tomentum, peduncles axillary shorter than the leaves 1–3-fl., flowers with 2 ovate bracteoles at the base, calyx tomentose 5-cleft, lobes unequal, berry oval or subglobose 3-celled, seeds compressed forming 2 rows in each cell. *Miq. Fl. Ind. Bat.* i. pt. i. 477; *Benth. Fl. Hongk.* 121; *Bedd. Fl. Sylv. Anal. Gen.* t. xiv. Myrtus tomentosa, *Ait.*; *DC. Prodr.* iii. 240; *Vahl Symb.* ii. 56; *Blume Bijdr.* 1081; *W. & A. Prodr.* i. 328; *Wight Ill.* ii. 12, t. 97*, f. 3, *Ic.* 522; *Roxb. Fl. Ind.* ii. 498; *Wall. Cat.* 3630; *Korth. in Ned. Kruidk. Arch.* i. 197. M. canescens, *Lour. Fl. Cochinc.* i. 311.

WESTERN PENINSULA, Pulney Hills, *Beddome*; Nilghiris, *Adam.* EASTERN PENINSULA, MALACCA, *Griffith. Maingay*; SINGAPORE and PENANG, *Thomson, Anderson.* CEYLON, alt. 6–8000 ft., *Walker, &c.*

A shrub, 4–5 ft.; young parts clothed with thick tomentum. Lower *leaves* in threes, upper ones and those of the branches opposite, 1–2½ in. with 3 or rarely 5 prominent nerves starting from near the base, dark brown above, at length glabrous and shining, hoary beneath and rugose. *Peduncles* about half the length of the leaves, bearing 1–3 large pink flowers ½–¾ in. across. *Petals* downy outside, shortly clawed. *Berry* about the size of a cherry, dark purple, pulp fleshy, sweet and aromatic.—Col. Beddome says that this is abundant on the higher mountains in the Madras Presidency, and is known at Ootacamund as "Hill Gooseberry." The fruit is eaten raw, or made into jam called "Thaonty." Its wood is white with pink heart, the grain close and cutting like cheese, but splitting when seasoned; useful for small turnery.

7. DECASPERMUM, *Forst.*

Shrubs or small trees. *Leaves* opposite, pinnate-nerved. *Flowers* small, in axillary racemes, and sometimes forming terminal leafy panicles, occasionally polygamous. *Calyx-tube* campanulate, scarcely or not at all produced above the ovary; lobes 4 or 5, spreading. *Stamens* ∞, in several series, free, filaments filiform; anthers small, versatile, with parallel cells opening longitudinally. *Ovary* 4- or 5-celled with 2 or very few ovules in each cell; cells often divided by spurious dissepiments; style filiform, stigma peltate. *Berry*

globular, crowned with the calyx-lobes. *Seeds* few, reniform; testa hard; embryo hippocrepiform or circular, with a long radicle and short linear cotyledons.—DISTRIB. Species about 4, inhabiting Tropical Asia and Australia, and the Pacific Islands.

Closely related to Myrtus.

1. **D. paniculatum,** *Kurz in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 61; *For. Fl. Brit. Burm.* i. 475; leaves shortly petioled oblong acuminate suddenly narrowing below, flowers in terminal and axillary panicles often polygamous, calyx-lobes roundish or subacute, ovary 4-celled. Nelitris paniculata, *Lindl. Collect. under* No. 16; *DC. Prodr.* iii. 231; *Wall. Cat.* 3627; *Wight Ill.* ii. 12, t. 97*, f. 10, *Ic.* 521; *Benth. Fl. Austral.* iii. 279. N. polygama, *Spreng. Syst.* ii. 488; *Korth. in Ned. Kruidk. Arch.* i. 197. N. pallescens, *Miq. Fl. Ind. Bat. Suppl.* i. 314. Eugenia polygama, *Roxb. Hort. Beng.* 92; *Fl. Ind.* ii. 491. E. cuspidata, *Wall. Cat.* 3627.

EASTERN BENGAL, KHASIA MTS.; PEGU, *Kurz*; MERGUI, *Griffith*; MALACCA, *Maingay, Cuming.*—DISTRIB. Java, Philippines, Australia.

A shrub or small tree; young parts and inflorescence covered with silky pubescence. *Leaves* 2 by about 1 in., abruptly contracted at the base, cuspidate-acuminate, dark and glossy above, paler and often of a reddish colour beneath. *Panicles* ascending, equalling or exceeding the leaves; bracts leaflike, or small and deciduous. *Flowers* small, crowded. *Calyx-tube* more or less clothed with white hairs; lobes usually less hairy or nearly glabrous. *Petals* ciliate. *Style* exserted. *Berry* globose, about $\frac{1}{6}$ in.—This plant varies much in the size of the flowers, the shape of the calyx-lobes, and in the degree of hairiness. I have given *M. pallescens* as a synonym on the authority of Kurz (Journ. As. Soc. Beng. xl. 57). Some of Maingay's Malacca specimens with an abnormally congested leafy inflorescence somewhat resemble *N. leucocoma.*

VAR. *khasiana*; leaves narrower, panicles long peduncled lax few-flowered, flowers larger, petals $\frac{2}{3}$ longer than the calyx.—Khasia, *Griffith, J. D. H. & T. T., Kurz.*

VAR. *Finlaysoniana*; leaves thicker, panicles shorter than the leaves, calyx-tube densely clothed with white tomentum, lobes all rounded and less hairy, stamens nearly equalling the petals. N. polymorpha, *Blume Mus. Bot.* i. 75, t. lx.; Hiræa Finlaysoniana, *Wall. Cat.* 7263.—No locality given, *Finlayson, Lobb.*

8. EUGENIA, *Linn.*

Trees or shrubs, smooth or rarely tomentose or villous. *Leaves* opposite rarely alternate, coriaceous or membranous, pinnate-nerved. *Inflorescence* centripetal with solitary axillary flowers, or in short racemes (leafless branches), or centrifugal in dense terminal cymes, or in terminal or lateral trichotomous panicles. *Bracts* usually small and deciduous. *Calyx-tube* globose or more or less elongate; lobes 4 rarely 5. *Petals* 4 rarely 5 or more or 0, free and spreading or united in a calyptra. *Stamens* ∞, in many rows, free or slightly combined into 4 bundles, filaments filiform; anthers small, versatile, bursting longitudinally. *Ovary* 2- rarely 3-celled; style filiform, stigma small; ovules ∞ in each cell. *Berry* drupelike, rarely dry and fibrous, crowned with the persistent calyx-limb. *Seeds* few, globose, variously compressed, testa membranous or cartilaginous; embryo thick and fleshy, radicle short, cotyledons thick more or less united or distinct.—DISTRIB. Upwards of 700 species inhabiting chiefly tropical and subtropical America, tropical Asia, a few in Australia and Africa.

SECT. I. **Jambosa.** *Inflorescence* cymose. *Calyx* usually with a thickened staminal disk and 4 conspicuous persistent lobes. *Flowers* showy, usually 4-merous. *Berries* large, turbinate or ovoid. *Seeds* large, with a thick fleshy endocarp. (To p. 481).

* *Flowers lateral, sessile or subsessile, usually from leafless axils.*

1. **E. formosa,** *Wall. Pl. As. Rar.* ii. 6, t. 108; *Cat.* 3609, *in part*; leaves large opposite or in threes nearly sessile elliptic-oblong obtusely acuminate cordate or amplexicaul at the base, racemes lateral short few-flowered, calyx-tube turbinate narrowed into a long pedicel, lobes unequal, fruit subglobose pendulous crowned with the recurved calyx-limb. *Kurz in Journ. As. Soc. Beng.* xlvi. pt. ii. p. 68; *For. Fl. Brit. Burm.* i. 492; *Wight Ill.* ii. 14. Jambosa formosa, *Walp. Rep. Bot.* ii. 191; *Blume Mus. Bot.* i. 92; *Miq. Fl. Ind. Bat.* i. pt. i. 412. J. mappacea, *Korth. in Ned. Kruidk. Arch.* i. 200.

EASTERN BENGAL and EASTERN PENINSULA, Chittagong, Upper Tenasserim, Moulmein. Banks of Attra R., *Wallich.*

A lofty tree with wide-spreading branches. *Bark* soft, ash-coloured, marked with the scars of fallen leaves. *Branchlets* alternately compressed or subtrigonous. *Leaves* crowded at the ends of the branchlets, 5– upwards of 16 by 4–4½ in., very coriaceous, shining above, paler beneath; midrib stout; lateral nerves prominent beneath, uniting within the margin. *Flowers* large, purple turning to red, scentless. *Peduncles* fleshy, branches clavate jointed near the middle; bracteoles 2, minute. *Calyx-tube* much produced; lobes spreading, orbicular. *Petals* twice as large as the calyx-lobes, shortly clawed. *Stamens* many, very long. *Ovary* turbinate. *Berry* size of a walnut, 2-celled, smooth, shining, white, insipid. *Seeds* large, rugose, greenish.

VAR. *ternifolia, Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 489 (sp.); leaves in threes. *Wall. Cat.* 3607; *Wight Ill.* ii. 14; *Ic.* t. 611; *Blume Mus. Bot.* 92 (*Jambosa*).—SIKKIM, *J. D. H.*; ASSAM and SILHET, *Wallich.* PEGU, *McClelland.*

2. **E. amplexicaulis,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 483; leaves opposite amplexicaul oblong with a rounded apex, peduncles short lateral 3- or 9-flowered, berries spherical size of a small apple. *Wight Ill.* ii. 14; *Ic.* t. 608; *Wall. Cat.* 3612; *Lindl. Bot. Reg.* 1033; *Kurz in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 68; *For. Fl. Brit. Burm.* i. 493. Jambosa amplexicaulis, *DC. Prod.* iii. 287. J. alba, *var.* amplexicaulis, *Miq. Fl. Ind. Bat.* i. pt. i. 414; *Blume Mus. Bot.* i. 96.—J. sylvestris alba, *Rumph. Herb. Amb.* i. 127, t. 39?

CHITTAGONG, *Roxburgh.*

A stately tree. *Trunk* tolerably straight, quickly dividing into numerous spreading branches. *Bark* of woody parts brown. *Leaves* 6–8 by 3–4 in. *Peduncles* trifid, each division 3-flowered. *Flowers* large, white, scentless. *Berry* greenish-yellow when ripe.—Kurz in Journ. As. Soc. Beng. l. c. refers to specimens in Herb. Brandis collected in Upper Tenasserim as coming very near to this species, and only differing from Roxburgh's figure by having a terminal inflorescence. In the figure given by Rumphius l. c. the leaves are acute at the base.

3. **E. malaccensis,** *Linn.*; *Lam. Dict.* iii. 196; leaves shortly petioled large ovate or elliptic-oblong attenuated at each end coriaceous glossy, racemes lateral dense shortly peduncled, flowers red, calyx-tube turbinate narrow below, lobes unequal, fruit subglobose or depressed-turbinate crowned with the incurved calyx-lobes. *Roxb. Fl. Ind.* ii. 483; *Wall. Cat.* 3611; *Wight Ill.* ii. 14, t. 98; *Bedd. Fl. Sylv. Anal. Gen.* cx.; *Kurz in Journ. As. Soc. Beng.* xlvi. pt. ii. p. 68; *For. Fl. Brit. Burm.* i. 493. E. macrophylla, *Lam. l. c.* Jambosa malaccensis, *DC.*; *Korth. in Ned. Kruidk.* (1847) 200; *Bot. Mag.* 4408; *W. & A. Prodr.* i. 332. J. purpurascens, *DC. l. c. excl. syn. Roxb.* J. domestica,

Rumph. Herb. Amb. i. 121, t. 37 (*not good*) *and* 38, f. i.; *DC. l. c.* 288; *Blume Mus. Bot.* i. 91; *Miq. Fl. Ind. Bat.* i. pt. i. 411; *Berg in Fl. Brazil* xiv. pt. i. 376. Myrtus macrophylla, *Spreng.*; *Blume Bijdr.* 1084. M. malaccensis, *Spreng*; *Blume l. c.* 1083.—*Burm. Fl. Ind.* 114; *Rheede Hort. Mal.* i. 29, t. 18.

MALAYA, *Maingay, Griffith.* CHITTAGONG (cult.?) J. D. H. & T. T. Tenasserim.—DISTRIB. Malayan Islands.—Many varieties are cultivated in different parts of the world.

A shrub, 6–8 ft. high, with terete-compressed branchlets. *Leaves* 9–12 by 3½ in., glossy on both surfaces; dots inconspicuous; nerves indistinct above, the primary ones few prominent beneath and uniting more or less distinctly within the margin, sometimes in double loopings; petiole stout, channelled above, ¼–½ in. *Flowers* large and handsome. *Calyx-tube* ¾ in.; lobes unequal, rounded, with membranous edges, the larger pair ⅜ in. long. *Petals* large, suborbicular, glandular. *Stamens* numerous, about 1 in. in length. *Style* long, persistent, nearly equalling the stamens. *Fruit* large and juicy, very generally eaten, but insipid (Roxburgh).—In a cultivated specimen from Chittagong the leaves are distinctly pellucid-punctate with large glands.

VAR. *purpurea*; fruit ovoid dark purple. E. purpurea, *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 483; *Wight Ill.* ii. 14; *Ic.* ii. 549. J. purpurea, *Wall. Cat.* 3610. J. domestica, var. purpurea, *Blume Mus. Bot.* i. 92; *Miq. l. c.*—J. nigra, *Rumph. Amb.* 125, t. 38, fig. 1?

4. **E. polypetala,** *Wight Ill.* ii. 14; *Ic.* t. 610; leaves ternate linear-lanceolate, peduncles lateral 3–4-flowered, corolla many-petalled. *Wall. Cat.* 3616; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 69; *For. Fl. Brit. Burm.* i. 493. E. salicifolia, *Buch. Cat.* 37. E. angustifolia, *Roxb. Fl. Ind.* 490.

SILHET, *Wallich*; KHASIA MTS., *Griffith*; CHITTAGONG, *Roxburgh.*

A small tree. *Leaves* 4–5 in. by nearly an inch in width, midrib and lateral nerves prominent beneath, uniting close within the margin. *Flowers* smaller than those of *E. diospyrifolia. Calyx-tube* broad, and rather more than ½ in. long when in flower.—Roxburgh says (l. c.) that this flowers in March and April, and the fruit ripens in June and July; it is readily known by its many (12–16) petals and the ternate leaves. Allied to *Jambosa æmula*, Blume, and *J. media*, Korth.

** *Flowers terminal and axillary.*

† *Calyx-tube broadly turbinate.*

§ *Calyx ½ in. or more in length.*

5. **E. diospyrifolia,** *Wall. Cat.* 3617; leaves long and narrow ovate-lanceolate or oblong acutely acuminate cordate at the base and nearly sessile, flowers terminal few, calyx-tube about ¾ in. long produced beyond the ovary, lobes very broad.

SILHET, *Wallich*; KHASIA, *Griffith.*

Leaves 6–7 by 1¾ in. pale coloured and with a yellowish tinge beneath.—Allied to *E. Munronii*, but the lateral nerves of the leaf are much less prominent beneath and do not form by their union such a distinct intramarginal one; the flowers are fewer on shorter peduncles, and the calyx-tube is broader above and not so attenuated below.

6. **E. Munronii,** *Wight Ill.* ii. 14; *Ic.* t. 546; leaves shortly petioled narrowly lanceolate obtusely acuminate somewhat cordate at the base very coriaceous, nerves prominent beneath uniting in a thick waving intramarginal one, cymes terminal, flowers large reddish or white, calyx-tube attenuated

below. *Bedd. Fl. Sylv. Anal. Gen.* cix. Jambosa samarangensis, var. heteromorpha, *Blume Mus. Bot.* i. 96. J. alba, var. heteromorpha, *Miq. Fl. Ind. Bat.* i. pt. i. 415.

KHASIA MTS., *Griffith*, J. D. H. & T. T.; KURG MTS., *Munro*; NILGHIRIS *Gardner*.

A middling-sized tree, 12–20 ft. in height. *Leaves* 6–9 by ¾–3 in. *Calyx-lobes* somewhat membranous.—Some of the Khasia specimens appear to be intermediate between this and *E. aquea*: the leaves are less attenuated at the apex, and not quite so prominently nerved; the flowers are rather larger than in either, and the calyx not so slender below as in typical examples of this species.

7. **E. aquea,** *Burm. Fl. Ind.* 114; leaves nearly sessile ovate oblong or ovate-lanceolate often cordate at the base, cymes terminal and from the upper axils shortly peduncled 3–7-flowered, fruit turbinate flattened at both ends. *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 492; *Wall. Cat.* 3613 & 3614 A. & B.; *Wight Ill.* ii. 14; *Ic.* t. 550; *Bedd. Fl. Sylv. Anal. Gen.* cix.; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. (1877) pt. ii. p. 69; *For. Fl. Brit. Burm.* i. 494. E. javanica, *Lam. Dict.* iii. 200, *in part.* Jambosa aquea, *DC.*, *W. & A. Prodr.* i. 332 excl. *Rumph.* t. 39; *Blume Mus. Bot.* 102; *Miq. Fl. Ind. Bat.* i. pt. i. 421; *Thwaites Enum.* 115; *Berg in Fl. Brazil* xiv. pt. i. 378. J. madagascariensis, *Blume Mus. Bot.* i. 103? Cerocarpus aqueus, *Hassk. Cat. Hort. Bog.* 262; *Bot. Zeit.* (1814) 593. Myrtus javanica, *Blume Bijd.* 1084.—*Rumph. Herb. Amb.* i. 126, t. 38, f. 2.

CHITTAGONG, AVA, PEGU, MARTABAN, and TENASSERIM (apparently only planted, *Kurz*).—CEYLON, ascending to 5000 ft.

A middling-sized tree, 20–30 ft., much-branched, variable in the form of its foliage, the shape of the calyx-tube, and the colour of the flowers. *Bark* smooth, ash-coloured. *Leaves* coriaceous, black-dotted, 1½–2¼ by 1–1½ in.; midrib prominent below, primary nerves 8–10 on each side forming inconspicuous loops near the margin. *Flowers* large, white, red, or pale purple. *Calyx-tube* turbinate or cylindrical, about 1 in.

8. **E. densiflora,** *DC. Prodr.* iii. 287 *under Jambosa*; leaves petioled oblong or oblong-lanceolate rounded at both ends or shortly acuminate the apex coarsely nerved and reticulated, cymes compact terminal, flowers 2 or 3 together on short pedicels, "calyx and petals tinged with clear rose-colour, filaments long rose-coloured" (Maingay MSS.), fruit nearly spherical 2-seeded. E. corymbosa, *Roxb. Fl. Ind.* ii. 497; *Wight Ic.* t. 627? Jambosa densiflora, *Korth. in Ned. Kruidk. Arch.* i. 200; *Blume Mus. Bot.* i. 93; *Miq. Anal. Ind.* i. 17; *Fl. Ind. Bat.* i. pt. i. 416. Myrtus densiflora, *Blume Bijd.* 1087.

MALACCA and SINCAPORE, *Maingay*, No. 758, 760, 760½.—DISTRIB. Malayan Islands.

Upper branches stout, 4-gonous, with reddish bark peeling off in shreds. *Leaves* from 4 to upwards of 10½ by 1½–3 in., slightly polished above, often conspicuously dotted beneath; midrib stout; primary nerves distinct on both surfaces, prominent beneath and uniting to form two conspicuous intramarginal nerves; petiole ⅜ in. *Branches* of *inflorescence* thick and 4-gonous, often articulated and breaking up into cubical segments. *Calyx-tube* turbinate, ⅜ in.; lobes 4, large, rounded, with membranous edges, opposite pairs equal. *Style* long, persistent. *Fruit* ½ in. in diam., crowned with the persistent calyx-lobes.—Allied to *E. Jambos*, from which it differs in the shape and nerving of the leaves, smaller flowers and more unequal calyx-lobes. The leaves of the Sincapore specimens are much smaller and less distinctly punctate below. Miquel says (Fl. Ind. Bat. l. c.) "seems to be the same as *E. corymbosa*, Roxb. (Wight Ic. ii. 627)," but the petals in Roxburgh's coloured fig. No. 1143 are bright yellow.

9. **E. Jambos,** *Linn.*; leaves narrowly lanceolate acuminate attenuated at the base into a short petiole coriaceous midrib stout nerves prominent below and uniting within the margin in a distinct and continuous one, racemes short terminal, flowers large white, calyx-tube turbinate, berry subglobose crowned with the 4 persistent calyx-lobes. *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 494; *Wall. Cat.* 3615; *Wight Ill.* ii. 14; *Ic.* t. 435 (vulgaris); *Bedd. Fl. Sylv. Anal. Gen.* cx.; *Brandis For. Fl.* 233. *Kurz in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 69; *For. Fl. Brit. Burm.* i. 495. Jambosa vulgaris, *DC.*; *Blume Mus. Bot.* i. 93; *W & A. Prodr.* i. 332; *Bot. Mag.* 3356; *Miq. Fl. Ind. Bat.* i. pt. i. 425; *Berg in Fl. Brazil* vol. xiv. pt. i. 377. Myrtus Jambos, *Kunth*; *Korth. in Ned. Kruidk. Arch.* i. (1846) 200; *Blume Bijdr.* 1085.—*Rumph. Herb. Amb.* i. 123; *Rheede Hort. Mal.* i. 27, f. 17.

Indigenous in the SIKKIM TERAI (*Brandis*); BURMA (cult. only *Kurz*), PEGU, *McClelland*; PENANG, *Wallich.*—DISTRIB. Yunan to Australia. (Said to be naturalised at Hong Kong).

A moderate sized tree; branchlets compressed or sub-4-gonous. *Leaves* variable in length, 1½–2 in. broad; nerves reticulate beneath; midrib stout; petiole short and stout, ¼ in. or less. *Calyx-tube* produced above the ovary; lobes round. *Berries* 1–2 in. diam.

VAR. *divaricàta*; branchlets stout distinctly 4-gonous, cymes terminal and from the upper axils dense subsessile, branches stout spreading. Penang (Maingay, 735).—This resembles *E. densiflora* in its inflorescence.

10. **E. macrocarpa,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* 497; leaves shortly petioled lanceolate acuminate narrowed at the base rounded or subcordate coriaceous minutely dotted, midrib and nerves very prominent beneath and uniting in conspicuous double marginal loopings, interspaces reticulate, cymes compact terminal and lateral subsessile, flowers sessile, bracteoles persistent at the nodes, calyx-tube turbinate narrow below, limb suboctofid, lobes unequal, berry globose. *Kurz in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 68; *For. Fl. Brit. Burm.* i. 492; *Wight Ic.* t. 612. Jambosa macrocarpa, *Miq. Fl. Ind. Bat.* i. pt. i. 417. J. coarctata, *Blume Mus. Bot.* i. 99.

ASSAM and CHITTAGONG, *Wallich*; CACHAR, *Keenan*; MOULMEIN, *Falconer*; MALACCA, *Griffith*, *Maingay* (736 Kew Distrib.); PEGU and MARTABAN, ascending to 2000 ft., *Falconer*, *Brandis*.—DISTRIB. Malay Archipelago.

Branchlets 4-gonous. *Leaves* rarely subalternate, or in threes, 5–10 by ½–4 in.—In Maingay's Malacca specimens the angles of the branchlets are winged, and the bark is of a reddish colour; the petioles are stout, rather less than ⅕ in.; calyx-tube ½ in.; style long and persistent. Roxburgh describes the fruit as about the size of an orange, and resembling that of *Dillenia indica*; it is eaten, and ripens in August and September. In Roxburgh's figure a section of the fruit shows it to be 5-seeded. The leaves are drawn too acute. Keenan describes it as being rather a tall tree with short horizontal branches; buds roundish, rosy; the bruised leaves smell like cinnamon, and the stamens are clove-scented. In Griffith's plant the calyx-tube is finely striate, and there is a slight constriction near the middle.

11. **E. javanica,** *Lamk. Dict.* iii. 200; leaves subsessile elliptic-oblong rounded at the apex or obtusely acuminate rounded or subcordate at the base, cymes axillary and terminal shorter than the leaves long-peduncled lax many-flowered, flowers white, berries depressed-turbinate. *Kurz in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 69; *For. Fl. Brit. Burm.* i. 494. E. alba, *Roxb. Hort. Beng.* 39; *Fl. Ind.* ii. 493; *Wall. Cat.* 3614 C. Jambosa alba, *Rumph. Herb. Amb.* i. 127, t. 39; *W. & A. Prodr.* i. 332; *Wight Ill.* ii. 14; *Ic.* t. 548; *Miq. Fl. Ind. Bat.* i. pt. i. 413 *in part.* J. samarangensis, *DC. Prodr.* iii. 286; *Korth. in Ned. Kruidk. Arch.* i. 201; *Blume Mus. Bot.* i. 95; *Bijd.* 1084

(*Myrtus*); *Berg in Fl. Brazil* vol. xiv. pt. i. 377. J. macrophylla, *DC. Prodr. l.c. in part.*

MALACCA, *Griffith*; ANDAMAN and NICOBAR ISLANDS, *Kurz.*—DISTRIB. Malay Islands.

A tree; trunk rarely straight and soon divided, branchlets terete or terete-compressed. *Leaves* 5–6½ by 1¾–2¾ in., or larger in cultivated examples; nerves indistinct above, slender but prominent beneath and uniting in loops within the margin. *Calyx-tube* turbinate, about ½ in., slender below; lobes 4, rather unequal, membranous at the edges. *Berry* size of a medlar, white or red.—This tree, according to Mr. Kurz, flowers in March and April, and the fruit ripens in May and June.

VAR. *Roxburghiana*, Wall. MSS. (sp.); leaves shortly petioled cordate at the base rounded at the apex, cymes compact terminal. E. decora, *Wall. Cat.* 3608. Chittagong.

12. **E. pendens,** *Duthie*; young branches terete, leaves shortly petioled oblong or ovate-lanceolate narrowed below obtusely acuminate subcoriaceous pellucid-punctate, principal lateral nerves prominent beneath and widely separated, cymes terminal and axillary 5–7-flowered, flowers large the lower ones long pedicelled, calyx-tube turbinate.

MALACCA, *Griffith*, 2349, *Maingay*, 747.

"Rather a small tree with pendent branches" (Griffith). *Leaves* shining a little on the upper surface, 5–8 by 2–3½ in.; nerves indistinct above prominent beneath, uniting in a distinct looping one within the margin; petiole ⅜ in. *Peduncles* equalling the petioles or a little longer; lower pedicels about ½ in. *Calyx-tube* ⅜ in.; lobes 4, rounded, with membranous edges, opposite pairs equal, reflexed after flowering. *Petals* large, orbicular. *Style* very long, 1¼ in., persistent.

§§ *Calyx less than ½ in. in length.*

a. Flowers pedicelled.

13. **E. Wallichii,** *Wight Ill.* ii. 17; *Ic.* t. 536; leaves lanceolate or elliptic-oblong acuminate acute at the base dark and shining above, lateral nerves uniting twice within the margin, cymes corymbose axillary and terminal shorter than the leaves, calyx-tube suddenly contracted at the base lobes prominent persistent, petals frequently expanding before falling, berries oblong. C. bifaria, *Colebr. in Wall. Cat.* 3606. E. præcox, *Roxb. Fl. Ind.* ii. 488?; *Wight Ic.* t. 619; *Kurz in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 66; *For. Fl. Brit. Burm.* i. 483.

SIKKIM, *J. D. H.*; KHASIA and BHOTAN, *Griffith*; ASSAM, *Masters*; SILHET, *J. D. H. & T. T.*; CHITTAGONG, *Roxburgh, J. D. H. & T. T.*; MERGUI, *Griffith.*

A tree; branchlets stout, quadrangular. *Leaves* 4½ by 1¾ in., coriaceous, rusty-coloured beneath; petiole about ½ in. *Flowers* white. *Calyx-tube* about ¼ in. long. *Stamens* about 4 times the length of the calyx. *Style* long, persistent. *Berry* about ½ in., crowned with the cup-shaped calyx-limb.—In Roxburgh's figure of *E. præcox* the inflorescence is more branched and the flowers rather smaller; the leaves are drawn acutely acuminate.

VAR. *lanceæfolia*; leaves rounded at the base, petiole much shorter; E. lanceæfolia, *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 494. SILHET FORESTS, *Roxburgh.* CHITTAGONG, *J. D. H. & T. T.*

β. Flowers sessile.

14. **E. grandis,** *Wight Ill.* ii. 17; *Ic.* t. 614; leaves large thick hard and coriaceous shining broadly obovate or suborbicular abruptly acuminate or

rounded at the apex narrowed or rounded at the base, nerves prominent beneath or on both surfaces, panicles terminal and axillary not exceeding the leaves, flowers large, calyx-tube turbinate attenuated below, petals free and expanding, berry globose or somewhat pyriform crowned with the large spreading cup-like calyx-limb. *Bedd. Fl. Sylv. Anal. Gen.* cvii.; *Kurz in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 67; *For. Fl. Brit. Burm.* i. 489. E. firma, *Wall. Cat.* 3603; *not of DC.* Jambosa grandis, *Blume Mus. Bot.* i. 108. J. firma, *Blume l. c.* J. urceolata, *Korth. in Miq. Fl. Ind. Bat.* i. pt. i. 418 *in part.* Syzygium grande, *Walp. Repert.* ii. 180; *not of Wall. Cat.* 3554. E. cymosa, *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 492; *not of Lam.* S. firmum, *Thwaites Enum.* 417. S. montanum, *Thwaites l. c.* 116.

SILHET, *Wallich*; PEGU, MARTABAN, and TENASSERIM, *Brandis*; MOULMEIN and MERGUI, *Griffith*; MALACCA, *Griffith, Maingay*; SINGAPORE, *Walker*; CEYLON, *Thwaites*, ascending to 4000 ft.—DISTRIB. Borneo, &c.

A large tree. *Leaves* 4–8 by 3–3½ in.; lateral nerves sometimes forming double loopings within the margin; petiole ¾–1 in. *Calyx-lobes* short, rounded, unequal. *Berries* 1 in. to 1¼ in.—Blume distinguishes his *J. firma* specifically by the nerves not being impressed on the upper surface, and by the more unequal calyx-lobes. The Ceylon specimens have the leaves very much polished, the lateral nerves more numerous and uniting closer to the margin, the cymes more lax and fewer-flowered. A plant from Amherst named *E. ficifolia*, MSS. in Herb. Wallich 3603 B, has the leaves very large and more rounded at the base.

15. **E. lepidocarpa,** *Wall. Cat.* 3618 *in part*; leaves broadly ovate or elliptic-oblong abruptly acuminate or rounded at the apex shining above, nerves prominent on both surfaces, interspaces finely reticulate, panicles terminal few-flowered, flowers sessile, calyx ¼ in. campanulate spreading above, petals free and spreading. *Kurz in Journ. As. Soc. Beng.* xlvi. pt. ii. p. 68. E. grandis, *var.* lepidocarpa, *For. Fl. Brit. Burm.* i. 490. Syzygium palembanicum, *Miq. Fl. Ind. Bat. Suppl.* i. 313.

PEGU and TENASSERIM, *Brandis*; MALAYA, *Griffith, Maingay*; SINGAPORE, *Wallich.*—DISTRIB. Sumatra.

Branchlets greyish, more or less compressed at the nodes. *Leaves* thick, coriaceous, smaller than those of *E. grandis*; midrib furrowed above, stout beneath; petiole about ¼ in. *Panicle* branches angular, much compressed below the nodes. *Calyx* pedicel-like below; lobes rather unequal, rounded, with membranous edges. *Berries* about ½ in., subglobose, crowned with the cup-like calyx-limb, often prominently ribbed longitudinally.

VAR. *minor*; leaves and flowers smaller, panicles axillary and terminal, flowers crowded in umbel-like heads.—The leaves resemble those of *E. mangifolia* and the inflorescence has more the habit of *E. Wallichii.*—MALAYA, *Griffith* (2416).

15*. **E. Beddomei,** *Duthie*; leaves crowded broadly ovate abruptly attenuate below very coriaceous polished above, midrib and stout lateral nerves prominent beneath freely anastomosing towards the margin and uniting at some distance from it, inflorescence elongate, branches acutely 4-gonous, petals free.

TINNEVELLY Hills; alt. 5000 ft., *Beddome.*

A large tree. *Leaves* 4½ by 3 in., rounded or emarginate at the apex; petiole ½ in. or less, stout; midrib channelled above. *Flowers* like those of *E. grandis.*

16. **E. tetraëdra,** *Miq. Fl. Ind. Bat. Suppl.* i. 310 (Jambosa?); branchlets compressed acutely 4-gonous or the older ones subterete, leaves broadly elliptic often folded very coriaceous shining above rusty coloured beneath, nerves prominent on both surfaces, cymes terminal and axillary with divaricate

branches, calyx-tube about ½ in. gradually tapering to the base, lobes 4 prominent, petals free or slightly united, berry ovoid or subglobose size of cherry.

MALACCA, *Griffith, Maingay*, 732.—DISTRIB. Sumatra.

A large tree. *Leaves* 3–6 by 1½–2¼ in.; lateral nerves uniting close to the margin; petiole ¾ in. Branches of *inflorescence* flattened below the flowers. *Calyx-lobes* with pale membranous edges.—Kurz in a MS. note on a specimen in the Calcutta Herbarium suspects that this is the *E. tetraëdra* of Miquel, but with some hesitation on account of the terete branchlets. The examination of a more complete series of specimens in the Kew Herbarium enables me to confirm his suspicion.

17. **E. pachyphylla,** *Kurz in Journ. As. Soc. Beng.* xlii. 332 (1873); *For. Fl. Brit. Burm.* i. 490; leaves obovate or obovate-oblong more or less cuneate at the base acuminate thick and coriaceous, flowers usually solitary or in threes sessile arranged in short stout terminal 3-chotomous panicles, branches 4-gonous articulate, calyx about ⅓ in. long obconical attenuate below, lobes 4 rounded persistent.

TENASSERIM, *Brandis*, alt. 3000 ft. MALACCA; *Griffith, Maingay.*

A tree. *Branchlets* white. *Leaves* 3–4 in., turning dark when dried; lateral nerves slender, prominent, distant; petiole thick, ¼–⅓ in.—Flowers in April.

18. **E. tristis,** *Kurz in Journ. As. Soc. Beng.* vol. xlii. 233 (1873); *For. Fl. Brit. Burm.* i. 490; leaves elliptic or elliptic-obovate acute at the base obtusely apiculate coriaceous, panicles corymbose terminal sessile, branches short stout, berry size of cherry depressed-globose crowned with the 4-lobed discoid calyx-limb.

TENASSERIM, *Brandis.*

A tree. *Branchlets* terete, thick, pale brown. *Leaves* 4–5 in., opaque; lateral nerves rather distant, stout, prominent. *Berry* 2- or 1-seeded. *Calyx-lobes* ⅛ in. (in fruit) rounded.

†† *Calyx-tube hemispherical.*

19. **E. hemispherica,** *Wight Ill.* ii. 14; *Ic.* t. 525; leaves opposite rarely subalternate petioled ovate-lanceolate or oblanceolate narrowed towards the base acuminate at the apex or often rounded, cymes axillary and terminal solitary or in pairs shorter than the leaves, calyx-tube short semiglobose, disk 4-gonal, petals large orbicular reflexed glandular, berry spherical. *Bedd. Fl. Sylv.* t. cciii. Strongylocalyx hemisphericus, *Blume Mus. Bot.* i. 90. *Thwaites Enum.* 116.

From S. CANARA to CAPE COMORIN, at about 3000 ft. alt., KURG MTS., ANAMALLAY and TINNEVELLY GHATS, *Beddome.* CEYLON, up to alt. 4000 ft., *Thwaites.*

A large tree, upper branches subtetragonous. *Leaves* minutely dotted, 2–6 by ¾–2 in.; nerves inconspicuous above more prominent beneath, and uniting within the margin but not very regularly, with sometimes a second but fainter nerve close to the edge; petiole ⅜–½ in. *Inflorescence* pyramidal. *Peduncles* 6–9-flowered. *Flowers* large, white, varying in size. *Berries* about 1 in. in diam.—This species varies much in the shape of the leaves and in their appearance when dried. The timber is useful for various purposes.

20. **E. lanceolaria,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 494; leaves shortly petioled narrowly lanceolate, flowers terminal about 15 together corymbose fascicled, berries irregularly round lobate. *Wight. Ic.* t. 613.

SILHET, "*Roxburgh.*"

A small tree 10–12 ft. in height. *Flowers* very large, rosy, and somewhat

fragrant. *Fruit* size of small apple, not eaten.—Col. Beddome believes it to be closely allied to *E. hemispherica.* I have not seen specimens.

††† *Calyx-tube slender, conical or clavate.*

§ *Flowers on long slender pedicels.*

21. **E. bifaria.** *Wall. Pl. As. Rar.* ii. 47, t. 161, *not of Wall. Cat.* 3606; leaves very shortly petioled crowded oblong acuminate rounded at the base shining and convex above, lateral nerves uniting at some distance from the margin in two conspicuous ones, corymbs axillary solitary branched few-flowered, calyx-tube clavate narrowed into a slender pedicel, lobes 4 roundish unequal, berry oval about 1 in. long crowned with the incurved calyx-lobes. *Wight Ill.* ii. 14; *Ic.* t. 609. E. laurifolia, *Roxb. Hort. Beng.* 92; *Fl. Ind.* ii. 489; *Wall. Cat.* 3605. Jambosa bifaria, *Miq. Fl. Ind. Bat.* i. pt. i. 422. J. laurifolia, *DC. Prodr.* iii. 287.

Silhet Mts., *Wallich.*

A tree, quite glabrous; branches terete or alternately compressed, or the ultimate ones obscurely 4-gonous, swollen at the nodes, ashy-coloured. *Leaves* about 5 in., twice or three times longer than the internodes; nerves prominent beneath nearly transverse; petiole terete, ½ in. *Corymbs* rather lax, two or three times shorter than the leaves, shortly peduncled. *Flowers* large, white, on slender pedicels. *Petals* orbicular, shortly clawed, twice as large as the calyx-lobes, minutely crenulate. *Stamens* numerous, long, spreading. *Berry* pendulous, 1½ in. long, yellow.—In some of Wallich's specimens named *E. laurifolia* the corymbs appear to be terminal.

22. **E. filiformis,** *Wall. MSS.*; leaves petioled rather small nearly ovate with a broad obtuse acumen coriaceous pellucidly dotted, cymes laxly racemose terminal or lateral, flowers solitary on long slender pedicels, calyx-tube turbinate or subcylindrical, lobes nearly equal, berries ovoid or roundish crowned with the 4 reflexed calyx-lobes 2-seeded. Syzygium filiforme, *Wall. Cat.* 3580. S. capillare, *Wall. Cat.* 3578.

Singapore and Penang, *Wallich*; Malaya, *Maingay, Griffith.*

Upper branches slender, rod-like, terete, or subcompressed at the nodes. *Leaves* 2–3 by 1¼–1½ in.; midrib prominent beneath, lateral nerves spreading out nearly at right angles with the midrib; petiole about ¼ in. *Pedicels* 1½ in. *Calyx-tube* ⅕ in. *Berries* ½ in. long by ⅜ in.—One of Maingay's specimens has a much longer almost cylindrical calyx-tube. Wallich's *E.* (*Syz.*) *capillaris* seems to be only a state of *E. filiformis* with thinner narrower leaves, shorter pedicels, and smaller flowers.

23. **E. Kurzii,** *Duthie in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. p. 68; *Kurz For. Fl. Brit. Burm.* i. 491; leaves more or less broadly lanceolate acute or attenuate at the base obtusely acuminate coriaceous pale beneath, flowers rather small white peduncled arranged in short axillary racemes or at the axils of fallen leaves, calyx-tube clavate-turbinate spreading above, lobes 4 rounded persistent, petals free, berry globose size of pea. E. cerasiflora, *Kurz in Journ. As. Soc. Beng.* xlii. (1873) 233; *not of Miquel.*

Sikkim, alt. 1–5000 ft., *J. D. H.*; Assam, *Jenkins*; Khasia Mts., *Kurz*; Mishmi, *Griffith*; Cachar, *Keenan*; Pegu and Martaban, *Kurz.*

A large tree 90–100 ft. *Branchlets* white, compressed or subtetragonous. *Leaves* 4–7 in., shining a little on the upper surface; lateral nerves slender but prominent; petiole ⅜–½ in. *Cymes* about 5-flowered. *Calyx-tube* ⅓–½ in., the produced portion ¼ in.; lobes ⅛ in., reflexed after flowering. *Petals* ⅓ in. *Filaments* slender. *Style* persistent. *Berry* ½–¾ in., 1–2-seeded, smooth, crowned with the spreading calyx-

limb.—The Assam specimens have smaller flowers and a more slender calyx-tube. No. 2356 of Griffith's collection from E. Bengal? differs from the above in having nearly sessile leaves and flowers. It is probably distinct, but the specimen is too incomplete, and the locality somewhat doubtful.

24. **E. albiflora,** *Duthie in Journ. As. Soc. Beng.* xlvi. (1877) pt. ii. 68; *Kurz For. Fl. Brit. Burm.* i. 491; leaves obovate or nearly ovate shortly and bluntly acuminate acute at the base, cymes from the upper axils or terminating older shoots few-flowered shorter than the leaves, calyx-tube narrow and slender below, lobes 4 rounded or subacute, petals united white.

BURMA, alt. 1000 ft., *Griffith* (2419).

A small tree with terete branchlets. *Leaves* 3–5 by 2–2¼ in., smooth, pale and indistinctly nerved above; lateral nerves rather distant and prominent beneath faintly uniting within the margin, interspaces finely reticulate; petiole ⅛ in. "*Buds* white" (*Griffith MSS.*). *Calyx-tube* about ½ in. long.

§§ *Pedicels shorter and more erect.*

25. **E. fusiformis,** *Duthie*; young branches 4-gonous, leaves petioled obovate-lanceolate cuneate below subcoriaceous pellucid-punctate, lateral nerves rather close, cymes terminal compact branches angular and somewhat winged, flowers 2 or 3 together on short pedicels, calyx-tube narrowly fusiform much produced above the ovary.

MALAYA, *Maingay* No. 743.

Bark yellowish. *Leaves* 4½ by 3 in., shining a little above, minutely dotted; midrib and nerves dark-coloured; lateral nerves uniting within the margin; petiole about ⅜ in. *Calyx-tube* ⅞ in. in length and ⅛ in. across at the widest part; lobes 4, rounded, reflexed after flowering. *Style* persistent, exserted portion equalling the calyx-tube.—Closely allied to No. 2236 of Beccari's Borneo plants.

26. **E. læta,** *Ham. in Trans. Wern. Soc.* v. 338 (*excl. syn. Rumph.*); leaves rather thin shortly petioled ovate-lanceolate attenuated at the base with a longish obtuse acumen pellucid-punctate, primary nerves directed upwards not distinctly uniting within the margin, peduncles terminal and axillary 1-few-flowered often jointed in the middle, calyx-tube long cylindrical tapering to the base, stamens crimson or purple numerous exceeding the large rounded petals, berry ovoid. Jambosa læta, *Blume Mus. Bot.* i. 104.

Moist Western Ghat forests from BOMBAY southwards, *Hamilton, Beddome, Gibson, Ritchie, Stocks.*

A small or middling-sized tree; branchlets terete, *Leaves* 4–5 by 1½–1¾ in., secondary nerves crossing the primary ones more nearly at right angles with the midrib; petiole ¼ in. *Flowers* large, 2–3 in. when expanded, crimson or white. *Calyx-tube* ¾–1 in.; lobes rounded, unequal, reflexed when in flower. *Petals* white, glandular. *Style* 1½ in. persistent.—Hamilton's type specimen in the British Museum from Mysore is certainly identical with the Western Ghat specimen named *S. pauciflora* in the Kew Herbarium.

VAR. *pauciflora,* Wight Ill. ii. 15; Ic. t. 526 (sp.); pedicels solitary from the extreme axils 1-flowered. Jambosa pauciflora, *Dalz. & Gibs. Bomb. Fl.* 94. E. Wightii, *Bedd. Fl. Sylv. Anal. Gen.* cix.—Courtallum, WIGHT.

27. **E. cylindrica,** *Wight. Ill.* ii. 14; *Ic.* t. 527; ultimate branches terete, leaves shortly petioled ovate-lanceolate acuminate coriaceous minutely pellucid-punctate, primary nerves prominent beneath forming double loops within the margin, cymes terminal or from the upper axils 3–8-flowered shorter

than the leaves, calyx-tube cylindrical tapering to the base constricted near the apex, fruit subspherical urceolate. *Bedd. Fl. Sylv.* t. 202; *Anal. Gen.* cix. Jambosa cylindrica, *Thwaites Enum.* 115.

CEYLON, ascending to 3000 ft., *Walker, Thwaites.*

A moderate-sized tree. *Leaves* 4–6 by 1½–1¾ in. The nervation forms a characteristic feature in this species, the lateral nerves uniting in a double system of intramarginal loopings, the inner one being situated about half-way between the midrib and the margin; petiole ¼–⅓ in. *Flowers* large, ½ to nearly 1 in. diam., white, turning to purple. *Calyx-tube* ¾ to nearly 1 in. long. *Petals* orbicular, dotted. *Fruit* ⅓–¾ in. diam.—Blume (*Mus. Bot.* i. 114) compares this with his *Clavimyrtus virens*; but the latter is distinguished by a more contracted inflorescence and the calyx shorter and less attenuated below.

28. **E. ramosissima,** *Wall. Cat.* 3604; leaves lanceolate or oblong-lanceolate attenuated towards the base acuminate subcoriaceous pellucid-punctate, cymes axillary and terminal much branched, branches spreading, calyx-tube clavate or narrowly obconical, lobes rounded nearly equal, petals densely glandular. Clavimyrtus ramosissima, *Blume Mus. Bot.* i. 115.

SIKKIM, *J. D. H.* SILHET, *Wallich.* KHASIA MTS., *Griffith.*

A tree; branchlets terete, with a pale yellow bark. *Leaves* 3–4 by about 1–1½ in., shining above, obscurely dotted, with a long acumen, narrowing at the base into a short petiole, reticulate-nerved beneath; midrib prominent; primary nerves few, slender, uniting in a looping one within the margin. *Calyx-tube* ⅜ in., tapering gradually to the base with nearly straight sides.—This species resembles *Jambosa glabrata* DC. but differs in the less slender and more branched peduncles; the leaves are narrower at the base and the nerves are more prominent.

29. **E. Helferi,** *Duthie*; upper branches 4-gonous, leaves shortly petioled lanceolate or ovate-lanceolate acuminate coriaceous pellucid-dotted, nerves inconspicuous primaries numerous uniting within the margin, interspaces finely reticulate, cymes terminal and from the upper axils branched shorter than the leaves, calyx-tube clove-shaped ¼ in., lobes 4, opposite pairs equal.

MERGUI, *Helfer* (2418). SINCAPORE, *Lobb.*

Bark of upper branches and of inflorescence reddish, deciduous. *Leaves* 3½–4 by 1–1½ in.; petiole about ¼ in.—Allied to *J. Teysmanni*, Miq. and *E. ramosissima*; from the latter it differs in having thicker leaves, the primary nerves much closer and less prominent beneath, but with a more distinctly continuous marginal one, branches of the inflorescence more erect, and flowers smaller.

30. **E. mangifolia,** *Wall. Cat.* 3619; leaves ovate-lanceolate acuminate thick coriaceous nervation prominent on both surfaces interspaces finely reticulate, cymes axillary and terminal corymbose, flowers large numerous, calyx-tube ⅜ in. dilated above, petals free. E. reticulata, *Wight Ill.* ii. 16; *Ic.* t. 541.

ASSAM, *Griffith, G. Mann*; SILHET, *Wallich*; KHASIA MTS., alt. 3–4000 ft., *J. D. H. & T. T.*

Branchlets terete. *Leaves* 3–5 by 1–2 in., shining above; lateral nerves uniting close to the margin sometimes in two continuous ones. *Calyx* much produced above the ovary.—This differs from *E. inophylla* in the more prominent nerves of the leaves and in the shape of the calyx. Miquel (*Fl. Ind. Bat.* i. pt. i. 435) speaks of it as being closely related to *Jambosa conferta*, Korth.

31. **E. inophylla,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 496; leaves shortly petioled ovate-oblong with an acute base obtusely acuminate closely nerved dark above and shining, cymes terminal corymbose, calyx clove-shaped,

lobes 4–5 short obtuse, petals 4–5 distinct, berries pyriform. *Wight Ill.* ii. 17; *Ic.* t. 623. Syzygium inophyllum, *DC. Prodr.* iii. 260; *Wall. Cat.* 3600, *in part.* Jambosa inophylla, *Miq. Fl. Ind. Bat.* i. pt. i. 433. Calyptranthes obtusifolia, *Ham. in Wall. Cat.* 3600 B.

SILHET, *Wallich*; MERGUI, *Griffith*; SINGAPORE and PENANG, *Wallich.*

A tree. *Trunk* straight. Young branches terete-compressed, polished. *Leaves* upwards of $4\frac{3}{4}$ by $2\frac{1}{2}$ in., thickly coriaceous; lateral nerves rather close, spreading transversely; petiole about $\frac{1}{4}$ in. *Calyx* $\frac{1}{4}$ in.—In Wallich's specimens (3600) the petals appear to be calyptrate. Although resembling the clove-tree it possesses no kind of fragrance: the large pear-shaped berries are not eatable (Roxburgh).

SECT. II. **Syzygium.** *Flowers* small, in compact cymes. *Calyx* without a thickened staminal disk, tube turbinate rarely elongate; limb 4–5-lobed, or truncate. *Petals* usually calyptrate. *Berries* small, globose pyriform or oblong, 1–2-seeded (to p. 500).

* *Cymes terminal and axillary, rarely from leafless axils* (to p. 496).

† *Petals usually free* (to p. 488).

§ *Calyx short, turbinate or subcylindrical.*

‡ *Berries globose or subglobose.*

a. *Lateral nerves of leaves rather distant.*

32. **E. anisosepala,** *Duthie*; leaves ovate-lanceolate acuminate lateral nerves close uniting at some distance from the margin, cymes terminal corymbose, calyx-tube turbinate about $\frac{1}{3}$ in. lobes unequal, petals free or slightly combined.

MALACCA, *Griffith, Maingay* 753.

"A very large tree" (Griff.); branchlets terete, grey, polished. *Leaves* 3–$3\frac{1}{2}$ by $1\frac{1}{4}$–$1\frac{1}{2}$ in., shining above, dark when dry. *Inflorescence*-branches sharply angled, alternately compressed upwards. Inner *calyx-lobes* broad and petaloid, appearing to fall early with the corolla, the two outer ones narrower and gibbous below. *Style* long, persistent.—In Griffith's plant the inflorescence is more branched and longer than the leaves, and the flowers are smaller ($\frac{1}{5}$ in.).

33. **E. Griffithii,** *Duthie*; leaves ovate or oblong-lanceolate narrowed at both ends coriaceous smooth and shining above, nerves impressed above prominent beneath, cymes terminal or from the upper axils, flowers 2 or 3 together at the ends of long compressed branches, calyx-lobes unequal, petals free thick edges membranous.

MALACCA, *Griffith* 2375.

Branchlets terete. *Leaves* 5–6 by 2–$2\frac{1}{2}$ in., shortly petioled; lateral nerves uniting in conspicuous loops at some distance from the margin and with a fainter set near the margin, interspaces reticulate. *Calyx-tube* about $\frac{1}{4}$ in.

34. **E. Thumra,** *Roxb. Hort. Beng.* 92; *Fl. Ind.* ii. 495; leaves broadly ovate or ovate-lanceolate shortly acuminate base subacute dark and shining above reddish beneath, lateral nerves horizontal prominent on both surfaces uniting conspicuously within the margin, cymes terminal and axillary long-peduncled, flowers sessile umbellate, calyx-lobes 4 rounded, petals free, berry spherical or subpyriform. *Wight Ic.* t. 617; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. (1877) pt. ii. p. 67; *For. Fl.* i. 488. Syz. speciosum, *Wall. Cat.* 3568.

Marshy parts of PEGU forests, *Kurz.* RANGOON, *Maingay.* AMHERST and MOULMEIN, *Wallich*; TENASSERIM, *Helfer.*

Branchlets terete, compressed. *Leaves* 5–8 by $2\frac{1}{2}$–$3\frac{1}{2}$ in., coriaceous, reticulate beneath; petiole $\frac{1}{4}$ in. Branches of *inflorescence* lax, quadrangular, many-flowered, bracteate.—A specimen in the Kew Herbarium under this name (I can find no type-specimens) is certainly Wallich's *S. speciosum.* Roxburgh's incomplete description and unfinished drawing (No. 2510) as far as they go agree fairly well with this latter. The flowers are sometimes 5-merous.

VAR. *ferruginea,* Wight Ic. t. 554 (sp.); petals 8. E. octopetala, *Ham.*—Mergui, *Griffith.*

35. **E. rubens,** *Roxb. Hort. Beng.* 92; *Fl. Ind.* ii. 496; leaves shortly petioled opposite or subalternate ovate-lanceolate shortly acuminate thinly cartilaginous glossy above finely nerved, panicles terminal and axillary corymbose branches acutely angular ultimate divisions umbelliform, petals free, berry size of small cherry. *Wight. Ill.* ii. 17; *Ic.* t. 630; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 67; *For. Fl.* i. 488. Jambosa Wightiana, *Blume Mus. Bot.* i. 106.

CHITTAGONG forests, *Roxburgh.* TENASSERIM from MOULMEIN to MERGUI, *Griffith, Kurz.*

Large tree; branchlets terete or subcompressed, white. *Leaves* $4\frac{1}{2}$–$6\frac{1}{2}$ in., turning black or reddish when dried; lateral nerves slender, uniting distinctly within the margin; petiole about $\frac{1}{4}$ in.? *Panicles* on longish peduncles, but falling short of the leaves.—Closely allied to the preceding. The leaves are of a thinner texture, the stamens longer, and the sepals and petals larger (Kurz).

b. *Lateral nerves of leaves close.*

36. **E. cymosa,** *Lam. Dict.* iii. 199; *not of Roxb.*; leaves ovate acuminate finely and closely nerved, cymes axillary and terminal shorter than the leaves, flowers small, calyx-tube campanulate lobes 4, petals free, berry globose size of large pea. *Wight Ill.* ii. 17; *Ic.* t. 555; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 67; *For. Fl.* i. 486. Syz. caudatum, *Wall. Cat.* 3591. S. vimineum, *Wall. Cat.* 3593?. S. concinnum, *Wall. Cat.* 3582. S. nelitricarpum, *T. & B. in. Nat. Tydsch. Ned. Ind.* xxv. S. cymosum, *DC. Prodr.* iii. 259; *Korth. in Ned. Kruidk. Arch.* i. 202?. E. nigrescens, *Poir. Suppl.* iii. 123?. E. rhodomelea, *Commers. in DC. Prodr. l. c.* Jambosa tenuicuspis, *Miq. Fl. Ind. Bat.* i. 431. Myrtus cymosa, *Spreng.*; *Blume Bijd.* 1086.

CACHAR, *Keenan*; SILHET and TAVOY, *Wallich*; BURMA, *Griffith*; MOULMEIN, *Helfer*; MALACCA, *Maingay, Griffith*; SINGAPORE and PULO DINDING, *Wallich, Kurz.* —DISTRIB. Java.

A large shrub or tree. *Leaves* 2–3 in., rounded at the base, smooth and polished above, often glaucous, with a longish slender but obtuse acumen; lateral nerves not very distinct, uniting close within the margin; petiole $\frac{1}{6}$–$\frac{1}{4}$ in. *Peduncles* equalling the petioles or shorter. "*Berries* slightly depressed at the apex, purple-black when ripe" (Maingay MS.).—Wallich's *E. concinna,* which I refer here doubtfully, has the leaves rather longer and more oblong; the petals appear to be free though not expanding; the specimens however are too incomplete for a proper determination.

VAR. *rostrata*; leaves with a long slender acumen more prominently nerved, lateral nerves spreading out towards the margin, petiole longer, calyx nearly truncate. —The leaves which remain green after drying resemble those of *E. verecunda.* E. rostrata, Bedd. MS.—Anamallays. Perhaps a distinct species.

37. **E. toddalioides,** *Wight Ill.* ii. 16; *Ic.* t. 542; leaves lanceolate acuminate attenuate towards the base coriaceous pellucid-punctate, cymes lateral

di- tri-chotomous each branch 1–3-flowered, calyx-limb dilated tube contracted not thicker than the pedicel, lobes 4 unequal shallow, petals free but not expanding.

SIKKIM, alt. 4000 ft., *Gamble?* MERGUI, *Griffith in Hb. Wight.*

A small tree. *Branchlets* subterete. *Leaves* 2–3 by 1–1¾ in.; lateral nerves many uniting close within the margin. *Flowers* about ¼ in.—Habit of *E. Gardneri* and *E. lissophylla* but the petioles are shorter than those of the former and the inflorescence is different from both.

38. **E. myrtifolia,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 490; leaves elliptic-lanceolate acuminate very shortly petioled, nerves not conspicuous close interspaces finely reticulate and punctate, cymes axillary lax on longish peduncles, branches acutely angular, flowers about 3 together small, calyx-tube broadly obconical or campanulate, lobes 4 conspicuous subacute, berry globular. *Wight Ill.* ii. 15; *Ic.* t. 618; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 67; *For. Fl.* i. 486. Syzygium myrtifolium, *DC. Prodr.* iii. 261; *Wall. Cat.* 3571; *Miquel Anal. Ind.* ii. 20; *Fl. Ind. Bat.* i. pt. i. 456. C. oleina, *Wight Ill.* ii. 15.

? E. Bengal, *Griffith*; Pegu, *McClelland*; Sincapore, *Wallich.*—DISTRIB. Sumatra, Borneo.

A shrub or small tree with 4-gonous branchlets. *Leaves* 1¾–3 by ¾–1 in., shining above, often rusty-red beneath. *Cymes* many-flowered, shorter than the leaves. *Petals* free or slightly united. *Style* persistent, exserted portion twice the length of the calyx-tube.—Affords a dark strong wood.

39. **E. micrantha,** *Thwaites Enum.* 117 (*Syzygium*); leaves ovate or elliptic obtusely acuminate narrow at the base obscurely dotted, cymes about equal to the leaves, flowers small, calyx acutely 4-lobed, petals free, berries red round size of pea. *Bedd. Fl. Sylv. Anal. Gen.* cviii.

CEYLON, central province, alt. 3–5000 ft., *Thwaites, Gardner.*

A moderate-sized tree. *Leaves* 2–4 by ¾–2 in.; petiole ⅛ to nearly ¼ in.—In Wight's herbarium there are specimens of this named *E. rubicunda*, which it resembles in many respects.

40. **E. acuminatissima,** *Kurz in. Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 67; *For. Fl.* i. 487; leaves ovate-lanceolate acutely acuminate pale shining indistinctly nerved above, cymes terminal and axillary lax exceeding the leaves, flowers small, calyx broad above lobes 5, stamens short. Myrtus acuminatissima, *Bl. Bijd.* 1088. Jambosa acuminatissima, *Hassk. in Flora* (1849) 592; *Miq. Fl. Ind. Bat.* i. 438. Syz. altissimum, *Wall. Cat.* 3588.

MERGUI, *Helfer*; MALACCA, *Maingay*; PENANG, *Porter.*—DISTRIB. Java.

Branchlets terete or subtetragonous. *Leaves* 3–6 by 1¼–2 in.; lateral nerves slender beneath; petiole ¼ in. *Inflorescence*-branches long, angular. *Calyx* saucer-shaped above after flowering. *Petals* only slightly united.—In Helfer's plant the lateral nerves unite at some distance from the margin with a second fainter one close to the edge, the inflorescence is more lax and divaricate.

‡‡ *Berries oblong.*

41. **E. Arnottiana,** *Wight Ill.* ii. 17; *Ic.* t. 999; leaves elliptic-oblong acuminate coriaceous closely nerved, cymes dense from the upper axils branches stout, flowers subsessile in umbels of 8–12, bracteoles long caducous, petals dis-

tinct, berries oblong. *Bedd. Fl. Sylv. Anal. Gen.* cvii. Syzygium densiflorum, *Wall. Cat.* 3601; *W. & A. Prodr.* i. 329.

Common on the NILGHIRI and PULNEY HILLS, alt. 6–7000 ft., *Wight*, &c. ANAMALLAY MTS., alt. 4000 ft., *Beddome*.

A large spreading tree, trunk low; branchlets 4-gonous. *Leaves* 2–3 by 1–1½ in., obscurely dotted, the numerous nerves uniting close within the margin; petiole ½-nearly 1 in. *Flowers* cream-coloured, crimson in bud. *Fruit* dark purple.—Timber valuable (called "Nawal"); the fruit is eaten but astringent (Beddome).

VAR. *Benthamiana*, Wight MSS. (sp.); leaves almost sessile cordate-amplexicaul upper generally solitary, flowers smaller, petals apparently united.—Nilghiri Mts., *Gardner*. Perhaps distinct.

A specimen in the Kew Herbarium from the Pulney Hills (No. 254 of Beddome's collection) I find a difficulty in placing satisfactorily. To the above species it bears a great resemblance but for the elongate calyx-tube.

§§ *Calyx elongate.*

‡ *Flowers axillary, racemose, calyx ⅓–1 in. long.*

42. **E. Maingayi,** *Duthie*; leaves shortly petioled long oblong-lanceolate acuminate rounded at the base, racemes short axillary or from the leafless axils of the rugged lower branchlets, calyx-tube elongate clavate about ⅖ in. glandular, lobes 4 rounded deciduous.

MALAYA, *Maingay* 750.

Older branchlets with rugged corky bark, upper stout, terete, reddish. *Leaves* 4½–7½ by 1¾–2¼ in., indistinctly nerved above, midrib stout beneath; petiole ⅛ in. *Style* short, acute.—This plant differs from the other members of the section in the rounded base of the leaves; it seems to approach nearest to *E. claviflora*, and has a general resemblance to *E. borneensis*, Miq. Fl. Ind. Bat. i. pt. i. 434 (Jambosa), but the petioles of the latter are much longer.

43. **E. claviflora,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 488; leaves lanceolate narrowed at the base obtusely acuminate, corymbs lateral subsessile umbelliform, calyx-lobes rounded, flowers clavate, berries long ovate crowned with the cyathiform base of the calyx-limb. *Wight Ill.* ii. 15; *Ic.* t. 606; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 65; *For. Fl.* i 480. Syzygium claviflorum, *Wall. Cat.* 3575. S. longiflorum *Wall. Cat.* 3572. S. excavatum, *Wall. Cat.* 3574.

SIKKIM and KHASIA MTS., alt. 2–4000 ft., *J. D. H. & T. T.*; SILHET and CHITTAGONG, *Wallich*; PEGU, *Kurz*; NICOBAR and ANDAMAN ISLANDS, *Kurz*; TENASSERIM, *Helfer*; SINGAPORE and PENANG, *Wallich*.

A tree. *Leaves* 3–6 by about 1⅓ in., rather closely nerved. *Berry* about an inch long.—In Chittagong this grows to be a stout useful timber-tree of very considerable size; it flowers in March, fruits in May; fruit eaten (Roxburgh). Wallich's specimens named *S. excavatum* have very thick coriaceous leaves somewhat revolute at the margin; the berries are ¾ in. long including ⅛ in. of projecting calyx-limb.

44. **E. leptantha,** *Wight Ill.* ii. 15; *Ic.* t. 528; leaves from ovate-elliptic to oblong-lanceolate obtusely acuminate narrowed into a very short petiole, cymes raceme-like arranged on the leafless axils or at the nodes of denuded branches, calyx-tube long narrow clavate, limb with broad shallow teeth or nearly truncate, berry clavate-oblong. *Benth. Fl. Austral.* iii. 283 (*Syz.*); *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 65; *For. Fl.* i. 480. Syz. suavissimum, *Wall. Cat.* 3573. Syzyg. *Griff. Notul.* 654.

SIKKIM, foot of hills, *J. D. H. & T. T.*; PEGU, *Kurz*; Rangoon, *Cleghorn*; MOULMEIN, *Falconer*; MERGUI, *Griffith*; AMHERST, *Wallich*; SINGAPORE and PENANG,

Wallich; ANDAMAN ISLANDS, *Helfer, Kurz*.—DISTRIB. Malay Archipelago to Australia.

A moderate-sized tree. *Leaves* 4–5½ by 1¼ in., pale, finely nerved. *Calyx-tube* about ½ in., finely attenuated towards the base; limb dilated and much produced beyond the ovary. *Berry* about ⅓ in.

45. **E. Wightiana,** *Wight Ill.* ii. 15; *Ic.* t. 529; leaves elliptic-oblong tapering at each end, peduncles axillary or in racemes on the leafless branches or shoots, calyx elongate clavate repandly 4–5-lobed, petals 12 or fewer by abortion the outer ones occasionally expanding. E. lanceolata, *Lam. Dict.* iii. 200; *Wight Ill.* ii. 15; *Ic.* t. 530; *DC. Prodr.* iii. 284; *Bedd. Fl. Sylv. Anal. Gen.* cx.; *W. & A. l. c.* (*Syz.*); *Thwaites Enum.* 119 (*Acmena*). Syzygium Wightianum, *Wall. Cat.* 3577; *W. & A. Prodr.* i. 330. Myrtus Soneratii, *Spreng. Syst.* ii. 485.

CONCAN, *Stocks*; NILGHIRI and DINDYGUL MTS., Quilon, *Wight*. CEYLON, ascending to 2000 ft., *Walker, Thwaites*.

A very showy tree when in full blossom (Beddome). *Leaves* 3–5 by 1½ in., pellucid-dotted. *Flowers* nearly sessile.—This varies much in the length of the calyx-tube, and the number of flowers. Its numerous petals give it a relation similar to *E. polypetala* in the Jambosa section.

‡‡ *Flowers in terminal and axillary corymbs. Calyx shorter.*

46. **E. pellucida,** *Duthie*; leaves narrowly oblong or oblanceolate rounded or subacute at the apex finely and closely nerved nerves and dots pellucid, cymes terminal and axillary, flowers crowded at the ends of the longish ascending branches, calyx-tube ⅛ in. slender below, lobes 4 prominent opposite pairs equal. E. contracta, *Wall. Cat.* 3602; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 65; *For. Fl.* i. 481, *not of Poir.*

MARTABAN to TENASSERIM, *Helfer* (2406, 2407), *Kurz*.

A shrub; branchlets terete. *Leaves* 2–6 by about 1 in., chocolate-coloured above when dry, paler beneath; nerves rather prominently reticulated; petiole ¼ in. *Cymes* sometimes exceeding the leaves. *Petals* orbicular, free or slightly combined.

VAR. *contracta*; leaves narrower, lateral nerves directed upwards, cymes mostly axillary and falling short of the leaves. Syz. contractum, *Wall. Cat.* 3602; *not of Poir. in DC. Prodr.* iii. 259 (*Eug.*).—Attran river, *Wallich*. Mr. Kurz is of opinion that the Martaban specimens with dry blackish and less distinctly-nerved leaves may prove to be distinct, or may be a large and long-leaved variety of *E. cuneata*, Wall.

47. **E. zeylanica,** *Wight Ill.* ii. 15; *Ic.* i. 73; leaves ovate- or linear-lanceolate acuminate polished above hard and coriaceous indistinctly nerved densely glandular, cymes axillary and terminal usually compact many-flowered, flowers white conspicuous, calyx-tube elongate-turbinate usually glandular and pruinose, lobes 4–5 conspicuous, petals free or united in a calyptra, berry subglobose white. *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 65; *For. Fl.* i. 481. E. spicata, *Lam. Dict.* iii. 201; *DC. l. c.* (Syz.). *Bedd. Fl. Sylv.* i. t. 202. E. glandulifera, *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 496. Syz. zeylanicum, *DC. Prodr.* iii. 260; *Wall. Cat.* 3564, *in part*; *Dalz. & Gibs. Bomb. Fl.* 94. S. politum, *Wall. Cat.* 3626. S. Belluta, *DC. l. c.* 261. Acmena zeylanica, *Thwaites Enum.* 118. A. parviflora, *DC. l. c.* 262. Jambosa bracteata, *Miq. Fl. Ind. Bat.* i. pt. i. 437. S. corticatum, *Wall. Cat.* 3565. Myrtus zeylanica, *Linn. Sp. Pl.* 675.—*Rheede Hort. Mal.* v. t. 20.

WESTERN PENINSULA, from CONCAN southwards; SILHET; MALAY PENINSULA to SINGAPORE; PENANG; ANDAMAN ISLANDS, *Kurz*; CEYLON, up to 4000 ft., *Thwaites*. —DISTRIB. Sumatra, Borneo.

A large shrub or moderate-sized tree; young branches often acutely quadrangular or winged. *Leaves* 1–5 in., varying in width from $\frac{1}{2}$–2 in., rounded or tapering at the base, giving off an aroma when bruised; petiole $\frac{1}{8}$–$\frac{1}{3}$ in. *Flowers* in clusters of 3–5, shortly pedicelled. *Calyx* and pedicels usually rough with glands. *Petals* soon falling off. *Berry* about the size of a pea.—According to Thwaites the narrow-leaved form is the most abundant in Ceylon.

VAR. *laxiflora*, Bedd. l. c.; flowers in lax racemes, panicles exceeding the leaves. —In a specimen collected by Col. Beddome on the Tinnevelly Hills some of the flowers have the pedicel-like calyx-tube unusually long.

48. **E. grata,** *Wall. Cat.* 3586 (*Syzygium*); leaves ovate-lanceolate narrowly acuminate rounded or subcuneate at the base distinctly punctate above glaucous beneath, flowers in dense clusters terminal and axillary, calyx narrowly campanulate smooth, berries black oval or subglobose crowned with the persistent calyx-lobes. *Wight Ill.* ii. 15; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 65; *For. Fl.* i. 480. E. scabrida, *Wall. Cat.* 3564 D. Myrtus quadrangularis, *Ham.*

ASSAM, *Jenkins, Griffith*; KHASIA MTS., *Griffith*; PEGU, *Kurz*; MOULMEIN, *Wallich*; MERGUI, *Griffith.*

A small tree. *Leaves* 3–5 by 1–2 in., sometimes almost acutely acuminate. *Calyx-tube* tapering below, pruinose, usually quite smooth or longitudinally ribbed when dried. *Berry* about $\frac{1}{4}$ in. long.—The flowers are rather larger than those of *E. zeylanica*, to which it is closely allied.

49. **E. linearis,** *Wall. Cat.* 3596 (*Syzygium*); leaves linear-lanceolate acuminate subfalcate indistinctly nerved above, flowers crowded at the ends of the branchlets, calyx campanulate pruinose limb 4-partite, petals free, berry size of a pea crowned with the persistent calyx-lobes.

INDIA? *Herb. Wallich* (without locality).

Leaves 2–3 by $\frac{1}{3}$–$\frac{1}{2}$ in., conspicuously dotted above; lateral nerves distant, uniting within the margin; petiole about $\frac{1}{4}$ in. *Flowers* larger than those of *E. zeylanica*; pedicels equal in length to the calyx-tube. *Style* nearly twice as long as calyx-tube. —A specimen of this in Rottler's Herbarium is named *Myrtus ruscifolia*, Willd., and is said to come from India.

50. **E. penangiana,** *Duthie*; leaves thick elliptic-obovate obtusely acuminate attenuate at the base nerves close indistinct on both surfaces, cymes short crowded towards the ends of year-old branches, calyx-tube narrowly clavate or subcylindrical nearly $\frac{1}{2}$ in. much produced lobes 4 small, petals free?.

PENANG, Government Hill, *Maingay*, 744.

Branchlets terete. *Leaves* $2\frac{1}{2}$–$2\frac{3}{4}$ by about 1 in., brownish-yellow when dried.—Allied to *E. chlorantha*, and No. 1567 of Beccari's Borneo plants.

A specimen at Kew, collected by Helfer (no locality given), comes near to this. The calyx-tube is rather longer and more spreading above after flowering; the leaves are of thinner texture, and more conspicuously nerved.

51. **E. skiophila,** *Duthie*; leaves elliptic-lanceolate with a slender obtuse acumen narrowed at the base subcoriaceous pellucid-punctate, calyx-lobes 4 incurved, petals small free spreading distant, berry red size of a pea.

PENANG, Government Hill, *Maingay*, in deep shaded ravines.

A small tree, 15 ft. *Branchlets* terete. *Leaves* shortly petioled, $4\frac{1}{2}$–6 by $1\frac{1}{2}$–2 in.; midrib rounded beneath; lateral nerves close, inconspicuous above, spreading at right angles and uniting close within the margin. *Calyx-tube* $\frac{1}{8}$ in. *Stamens* short.

52. **E. chlorantha,** *Duthie*; leaves ovate acuminate thick opaque shining nerves numerous close, cymes in short racemes from the upper axils or terminating previous year's shoots, calyx-tube $\frac{1}{4}$ in. cylindrical below, petals free greenish, berry globose about $\frac{1}{2}$ in. crowned with 4 rounded unequal calyx-lobes. Syz. rigidum, *Wall. Cat.* 3581; *not of DC.* (*Eug.*).

MALACCA, *Griffith, Maingay,* 733; SINCAPORE, *Wallich.*—DISTRIB. Malay Islands.

"A very elegant tree when in flower" (Maingay MS.). *Branchlets* terete. *Leaves* $2\frac{1}{2}$–$5\frac{1}{2}$ by $1\frac{1}{2}$–3 in.; midrib impressed above, prominent beneath; primary nerves slender prominent on both surfaces, uniting in loops within the margin, interspaces finely reticulate. *Calyx-tube* furrowed below. *Petals* $\frac{1}{5}$ in., reflexed. *Filaments* bright red.

53. **E. lineata,** *Blume Bijd.* 1087 (*Myrtus*); *Mus. Bot.* i. 116 (*Clavimyrtus*); leaves lanceolate-oblong or nearly elliptic obtusely acuminate narrow at the base, cymes axillary and terminal shorter than the leaves, calyx-tube clavate lobes 4, petals free, berry size of large pea crowned with the constricted calyx-limb. E. corymbosa, *Wall. Cat.* 3566 F. Jambosa lineata, *DC. Prodr.* iii. 287; *Miq. Fl. Ind. Bat.* i. pt. i. 428.

MALACCA, *Maingay* (720), *Griffith* (2390 in part); PENANG, *Jack.*—DISTRIB. Java, Borneo, Sumatra.

A shrub or small tree. *Branchlets* terete. *Leaves* 2–$3\frac{1}{2}$ by 1–2 in., coriaceous, shining above, finely nerved. Extreme branches of inflorescence 3-fl. *Calyx-tube* about $\frac{1}{4}$ in.; lobes about equal, persistent. *Petals* shortly clawed, suborbicular, twice the calyx-lobes.

54. **E. rubricaulis,** *Miq. Fl. Ind. Bat.* i. pt. i. 432 (*Jambosa*); leaves elliptic from an acute base long and obtusely acuminate shining above, smaller nerves and dots pellucid, cymes axillary and terminal, calyx-tube $\frac{1}{6}$ in. obovate-cylindrical, lobes 4, petals free.

TENASSERIM, *Helfer*; MALACCA, *Griffith.*—DISTRIB. Java.

Branchlets subterete, reddish. *Leaves* 2–3 by $\frac{2}{3}$–$\frac{5}{6}$ in., stiffly cartilaginous; midrib prominent beneath, tinged with red; lateral nerves close, distinct beneath, interspaces subreticulate; petiole $\frac{1}{12}$–$\frac{1}{6}$ in., channelled above. *Flowers* nearly sessile. *Calyx-lobes* ovate, rounded, scarious at the edges. *Anthers* cordate-apiculate.

55. **E. pyrifolia,** *Wall. Cat.* 3584 (*Syzygium*) *not of Desv.*; leaves ovate or oblong-lanceolate with a long obtuse acumen coriaceous dark and shining above, corymbs terminal trichotomous long-peduncled, calyx-tube about $\frac{1}{4}$ in. gradually tapering to the base lobes 4 shallow, petals united, berry oblong. Syzygium pyrifolium, *DC. Prodr.* iii. 261 (*Syzyg.*); *Korth. in Ned. Kruidk.* i. 204; *Miq. Fl. Ind. Bat.* i. pt. i. 457. Calyptranthes pyrifolia, *Blume Bijd.* 1090.

SINCAPORE, *Wallich.*—DISTRIB. Java.

A tree. *Leaves* $1\frac{3}{4}$–3 by $\frac{3}{4}$–2 in.; acumen sometimes $\frac{1}{2}$ in. long; lateral nerves close, conspicuous; petiole about $\frac{1}{4}$ in. *Flowers* sessile, in threes.—*Syz. punctulatum,* Wall. Cat. 3583, with less acuminate dull-coloured leaves, nerves less distinct, and more elongate fruit, may perhaps belong here; there are no flowers with the specimens.

56. **E. tumida,** *Duthie*; leaves oblong-ovate or obovate shortly acuminate narrowed at the base closely nerved, cymes terminal and axillary equalling or exceeding the leaves, calyx-tube $\frac{3}{10}$ in. narrow swollen below the middle.

MALACCA, *Maingay,* 755.

Branchlets terete. *Leaves* $2\frac{1}{2}$–$3\frac{1}{2}$ in., chocolate-coloured above, rusty-yellow

beneath when dried; lateral nerves slender, uniting close within the margin; petiole ¼ in. *Panicles* lax, spreading; branches acutely angular. *Calyx* with 4 nearly equal shallow lobes.—The *petals* are probably free, though not expanding. The swollen part of the calyx-tube is occupied by the ovary.

†† *Petals usually united and falling in one piece* (to p. 496).

§ *Cymes terminating the young shoots* (to p. 495).

‡ *Leaves broad, oblong or lanceolate* (to p. 494).

|| *Branchlets 4-gonous.*

57. **E. montana,** *Wight Ic.* t. 1060; young shoots acutely 4-angled, leaves petioled coriaceous lanceolate with a short obtuse acumen to obovate or orbicular obtuse, cymes terminal very numerous corymbose many-flowered branches often leafy, flowers small sessile or subsessile, fruit globose size of a currant. *Bedd. Fl. Sylv. Anal. Gen.* cvii.

NILGHIRI MTS., *Wight, Gardner, Schmidt.*

A very large tree; branchlets winged at the angles. *Leaves* occasionally alternate or subalternate, 5–6 by 2¼ in., smooth and shining above; primary nerves prominent beneath, becoming less distinct towards their union within the margin; midrib stout, channelled above; petiole ¼–nearly ½ in. *Peduncles* angled, often very flat and broad. *Flowers* in threes at the apex of each extreme division. *Calyx* obtusely 4-lobed. *Petals* calyptrate. *Fruit* purple, crowned with the calyx.—The wood is used for building purposes, &c.

58. **E. bracteolata,** *Wight Ill.* ii. 15; *Ic.* t. 531; young branches 4-gonous angles subacute, leaves short-petioled elliptic-lanceolate or oblanceolate acute or slightly acuminate at both ends pellucid-dotted, cymes terminal and from the upper axils shorter or not much longer than the leaves, the extreme divisions terminating in a cluster of 6–9 sessile flowers, each division and each flower with 2 small acute bracteoles, calyx-tube conical 4-gonous, limb repandly 4-lobed. *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 66; *For. Fl.* i. 482.

TENASSERIM, *Griffith, Helfer*; MERGUI, *Griffith*; MALACCA, *Maingay.*

A shrub or small tree. *Leaves* 4½–7 by 1½–2½ in.; midrib rather prominent beneath, primary nerves slender and uniting close within the margin, coriaceous, more or less polished above, dots not conspicuous; petiole about ½ in. Branches of *inflorescence* with acute angles. *Flowers* conspicuous, white according to Maingay.

59. **E. lissophylla,** *Thwaites Enum.* 117 (*Syzygium*); leaves ovate-lanceolate acuminate quite smooth faintly nerved beneath pellucid-punctate, cymes very often longer than the leaves, calyx-teeth short rounded, berry round size of a pea. *Bedd. Fl. Sylv. Anal. Gen.* cviii.

CONCAN, *Stocks*; NILGHIRI MTS., Herb. *G. Thomson*; CEYLON; forests in the Central Provinces, alt. 3–5000 ft., *Thwaites.*

A moderate-sized tree. *Branchlets* quadrangular. *Leaves* 1½–3 by ½ to about 1 in.; petiole ⅙–¼ in.—This plant much resembles *E. Gardneri*, but can be distinguished by its 4-sided branchlets, narrower leaves and shorter petioles.

60. **E. venusta,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 491; arboreous with numerous drooping branchlets, leaves shortly petioled oblong or broadly lanceolate obtusely acuminate, panicles axillary rarely terminal shorter than the leaves brachiate ultimate divisions 3-flowered, flowers myrtle-like, calyx 4-toothed, petals 4 orbicular reddish. *Wight Ic.* t. 625; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 67; *For. Fl.* i. 487.

TIPPERAH HILLS, *Roxburgh*; PEGU, *Kurz.*

Bark dark brown, smooth. *Ovary* 2-celled.—Wight's figure is copied from Roxburgh's (*Ic.* t. 1560) with the addition of a terminal panicle. Miquel (Fl. Ind. Bat. i. pt. i. 456) compares it with *Syz. Kalahiense*, Korth, but the leaves of the latter are smaller and of a different shape. In Kurz' specimens the branchlets have white bark.

61. **E. Gardneri,** *Thwaites Enum.* 117 (*Syzygium*); leaves pale green ovate-lanceolate rostrate-acuminate faintly parallel-nerved beneath pellucid-punctate, cymes axillary and terminal shorter than the leaves, calyx obscurely 4-toothed, berry spherical size of a small cherry.

ANAMALLAY and TINNEVELLY GHATS, up to 4000 ft. alt., *Beddome*; CEYLON, Central Provinces, alt. 2–4000 ft. alt., *Thwaites.*

A moderate-sized tree; *branchlets* terete or subtetragonous. *Leaves* $2\frac{1}{2}$–4 by 1–$1\frac{1}{2}$ in.; petiole slender, about $\frac{1}{2}$ in. *Flowers* small. *Petals* cohering and falling together.—Very close to *E. venusta*, Roxb., with which Mr. Kurz unites it; the marginal nerves are further from the edge, and the panicles are mostly terminal and more compact.

62. **E. subavenis,** *Duthie*; leaves ovate shortly and obtusely acuminate or retuse narrowed towards the base quite smooth on both surfaces nearly nerveless, cymes longer than the leaves. E. umbrosa, *Thwaites Enum.* 118 (*Syz.*), *not of Berg*; *Bedd. Fl. Sylv. Anal. Gen.* cviii.

CEYLON; open grassy places in the Central Provinces, alt. 5–6000 ft., *Thwaites.*

A moderate-sized tree, very much branched; ultimate branches 4-angled. *Leaves* 1–2 in. by $\frac{1}{2}$–nearly an inch in width; petiole about $\frac{1}{6}$ in.—This differs from *E. lissophylla* in the shape and nervation of the leaves; the inflorescence is similar in both (Thwaites).

63. **E. valdevenosa,** *Duthie*; leaves large elliptic acuminate petioled, midrib very prominent beneath, lateral nerves uniting to form a conspicuous marginal one interspaces finely and sharply reticulate, cymes terminal lax, calyx-tube gradually tapering to the base quadrangular lobes shallow, berry globose size of a small cherry crowned with the slightly projecting calyx-limb. E. elliptica, *Wall.* 3587 (*Syz.*); *not of Lam. nor Smith.*

PENANG, *Wallich*; MALACCA, *Maingay* (723 & 762).

A tree, about 15 ft. high (Maingay); branchlets tetragonous. *Leaves* 8–13 by 3–$4\frac{3}{4}$ in.; primary nerves $\frac{1}{3}$–$\frac{1}{2}$ in. apart; marginal nerves double; petiole $\frac{1}{4}$ in. or more. Branches of *inflorescence* angled and winged. *Calyx-tube* about $\frac{1}{4}$ in. *Petals* falling together. *Style* persistent.

64. **E. scoparia,** *Wall. Cat.* 3594 (*Syzygium*); branchlets virgate 4-gonous leaves shortly petioled ascending elliptic-lanceolate acuminate minutely and densely glandular lateral nerves inconspicuous, cymes ascending lax few-flowered, flowers small, calyx squarrose very shortly 4-lobed, corolla calyptrate, stamens short, fruit small spherical.

SINGAPORE, *Wallich.*

Leaves $2\frac{1}{2}$–$2\frac{3}{4}$ by $\frac{3}{4}$–1 in., reddish-brown above and yellowish beneath when dried, margins slightly revolute; petiole $\frac{1}{4}$ in. *Berry* crowned with the remains of the calyx-limb, wrinkled in drying. *Style* short, persistent in the pit formed by the produced calyx-limb.—Resembles *Syzygium avene*, Miq. Fl. Ind. Bat. Suppl. i. 312, and perhaps not specifically distinct.

|||| ***Branchlets terete.***

¶ ***Calyx-limb almost truncate.***

a. ***Calyx-tube shortly turbinate.***

65. **E. crenulata,** *Duthie*; leaves broadly ovate-oblong or suborbicular very thick and coriaceous shortly obtusely acuminate crenulate, nerves close prominent on both surfaces, cymes terminal corymbose main branches long, calyx-limb truncate, petals united in a thick calyptra.

MALACCA, *Maingay*, 739.

Branchlets terete. *Leaves* 4½–6 by 3–4 in., dull, black-dotted; midrib stout; lateral nerves uniting close within the margin, interspaces reticulated. *Cymes* exceeding half the length of the leaves. *Bracts* small at the base of the flowers and at the joints of the inflorescence-branches. *Calyx-tube* about ¼ in., turbinate, much produced above the ovary.—The foliage very much resembles that of *E. grandis.*

66. **E. venulosa,** *Wall. Cat.* 3585 (*Syzygium*); leaves ovate or broadly obovate obtuse or shortly acuminate attenuated below into a short petiole very coriaceous polished above, nerves slender but prominent on both surfaces, flowers in terminal corymbs, branches lax spreading exceeding the leaves, calyx-tube obconical $\frac{1}{6}$–$\frac{1}{5}$ in. limb nearly entire, corolla calyptrate, fruit subspherical crowned with the circular rim of the calyx-limb.

MALACCA, *Wallich, Maingay* 741, &c.; SINGAPORE, *Wallich, Walker.*

Bark grey; branchlets terete. *Leaves* 1½–3 by 1–2 in.; primary nerves uniting close within the margin, interspaces reticulate, dots inconspicuous; petiole about ⅛ in. Main branches of *inflorescence* 1–2 in. *Berry* about ½ in. in diam., longitudinally furrowed.—In Maingay's plant, which I would refer here, the corolla is rather more exserted in bud.

67. **E. caryophyllæa,** *Wight Ill.* ii. 15; *Ic.* t. 540; leaves shortly petioled obovate spathulate rarely ovate-lanceolate obtuse or with a short blunt acumen attenuated to the base, cymes terminal corymbose laxly trichotomous, flowers small about $\frac{1}{10}$ in., fruit globose size of a pea. *Bedd. Fl. Sylv. Anal. Gen.* cviii. Eugenia corymbosa, *Lam. Dict.* iii. 199; *DC. Prodr.* iii. 284. Syzygium caryophyllæum, *Gaertn. Fruct.* i. 166, t. 33; *DC. Prodr.* iii. 260; *Wall. Cat.* 3563; *W. & A. Prodr.* i. 329; *Miq. Anal. Ind.* i. 25; *Fl. Ind. Bat.* i. pt. i. 454; *Thwaites Enum.* 117. Calyptranthes caryophyllata, *Pers. Ench.* 4. Myrtus caryophyllata, *Linn.*—*Rheede Hort. Mal.* v. t. 27.

S. CANARA, *Law*; TRAVANCORE, *Wight*; CONCAN, *Stocks*; NILGHIRI MTS., *Kurz, G. Thomson*; CEYLON up to 3000 ft. alt., *Walker, Thwaites.*—DISTRIB. Borneo.

A large shrub, or middling-sized tree; branchlets terete. *Leaves* 3–4 by about 1½ in., subcoriaceous, dark above (when dried), rusty-red beneath, inconspicuously dotted. *Calyx* shortly turbinate, lobes 4 shallow.—A distinct species though varying considerably in the foliage. The fruit is eaten.

68. **E. frondosa,** *Wall. MS.*; leaves ovate-lanceolate with a long obtuse acumen cuneate at the base polished above lateral nerves slender prominent on both surfaces, cymes axillary and terminal shorter than the leaves, calyx-tube about $\frac{1}{6}$ in. narrow below suddenly enlarging above lobes very shallow, petals united. Syz. venosum, *DC. Prodr.* iii. 260; *Mém. Myrt.* t. 17; *Wall. Cat.* 3590.

NIPAL, *Wallich.*

Branchlets terete. *Leaves* 3–4 by about 1½ in., subcoriaceous; petiole ½–¾ in.—Habit of *E. mangifolia* but smaller in all its parts.

69. **E. areolata,** *DC. Prodr.* iii. 260 (*Syzygium*); *Mém. Myrt.* t. 18; leaves elliptic cuneate at the base acuminate subcoriaceous nerves reticulate marginal double, peduncles paniculate axillary and terminal 2 or 3 times shorter than the leaves, buds globose, calyx quite entire, corolla calyptrate.

NIPAL, *Wallich.*

Very nearly related to *E. frondosa.*—There are specimens in the Kew Herbarium, probably belonging to this species, fastened down on the same sheet with it, in which the leaves have dried of a fresher tint, and the difference in the nervation is considerable; the flowers also are rather larger.

b. *Calyx-tube slender and tapering.*

70. **E. khasiana,** *Duthie*; leaves narrowly lanceolate acuminate at both ends nerves and dots pellucid, cymes from the upper axils or terminal lax, flower-buds pyriform $\frac{1}{5}$ in., limb of calyx truncate.

KHASIA MTS., *Griffith, J. D. H. & T. T.*

Branchlets terete. *Leaves* 3–4 by 1 in., smooth and shining above, finely reticulate between the lateral nerves which unite close within the margin; petiole $\frac{1}{3}$ in. *Inflorescence*-branches long and slender, acutely quadrangular. *Calyx* spreading above after flowering.

71. **E. oblongifolia,** *Duthie*; leaves oblong acuminate narrowed towards the base nerves rather close slender but prominent on both surfaces, cymes terminal corymbose much branched shorter than the leaves, calyx-tube $\frac{1}{4}$ in. or less gradually tapering to the base limb truncate, petals calyptrate.

MALACCA, *Maingay* (746).

Branchlets terete or subtetragonous; bark greyish. *Leaves* 3–4½ by 1¼–1¾ in., shining a little above, lateral nerves uniting close within the margin, interspaces reticulated. *Inflorescence*-branches sharply 4-angular, compressed towards the nodes. *Filaments* slender; anthers small.

72. **E. expansa,** *Wall. Cat.* 3567 (*Syzygium*); leaves shortly petioled ovate or oblong-lanceolate obtusely acuminate subcoriaceous, cymes axillary or terminating previous year's shoots, flowers small crowded at the ends of the long peduncles, calyx nearly truncate.

PENANG, *Wallich.*

Young branches subterete, compressed at the nodes. *Leaves* 3–6 by 1½–2 in., polished a little above; lateral nerves slender, raised on both surfaces, uniting within the margin, interspaces reticulate; petiole $\frac{1}{5}$ in. *Calyx-tube* $\frac{1}{5}$ in., gradually tapering to the base. *Fruit* not seen.

¶¶ *Calyx-limb 4–5-lobed.*

73. **E. cordifolia,** *Wight Ill.* ii. 16; *Ic.* t. 544; leaves sessile cordate amplexicaul ovate or ovate-lanceolate obtuse or obtusely acuminate, cymes corymbose terminal and axillary much shorter than the leaves, berry nearly round crowned with the cup-like calyx-limb. E. androsæmoides, *Bedd. Fl. Sylv. Anal. Gen.* cvii.; *not of DC.* Syzygium cordifolium, *Thwaites Enum. Pl. Zeyl.* 116. Calyptranthes cordifolia, *Moon Cat.*

CEYLON; Ambagamowa and Ratnapoora districts, up to 3000 ft., *Thwaites.*

A very large handsome tree; branchlets terete. *Leaves* 6–8 by about 3 in., often larger, thick and coriaceous, polished above; midrib stout and prominent beneath; lateral nerves usually not very distinct, sometimes forming double loopings within the margin. *Calyx-tube* about $\frac{1}{6}$ in.; lobes 4. *Petals* calyptrate. *Berries* subglobose, about an inch in diameter.—*E. androsæmoides* of Wight's Herb. is *E. obovata*, Wall.

74. **E. subdecussata,** *Wall. Cat.* 3589 (*Syzygium*); leaves ovate or very shortly petioled oblong-lanceolate cordate at the base subacute thick and

coriaceous midrib keeled beneath lateral nerves indistinct, cymes terminal corymbose branches stout angled compressed and flattened upwards, flowers crowded, calyx-tube shortly obconic obscurely 5-lobed, petals calyptrate.

SINCAPORE, in very dense woods, *Wallich*; Government Hill, PENANG, *Maingay*, 740.

A tree, about 15 ft. high (Maingay). *Branchlets* terete-compressed. *Leaves* $2\frac{1}{2}$–4 by 1–$1\frac{3}{4}$ in., smooth and polished above; lateral nerves slender beneath, uniting close to the margin, interspaces laxly reticulate. *Flowers* red and white (Maingay). *Calyx-tube* about $\frac{1}{8}$ in., squarrose. *Bracts* triangular. *Fruit* size of a small cherry.

75. **E. colorata,** *Duthie*; leaves very shortly petioled elliptic or oblong-obovate rounded or subcordate at the base rather acutely acuminate very thick and coriaceous, cymes terminal, branches stout alternately compressed shorter than the leaves, flowers crowded in compact corymbs, petals united, calyx about $\frac{1}{3}$ in. with 5 shallow lobes.

MALACCA, *Maingay*, 749.

Branchlets terete, reddish-brown. *Leaves* 4–$5\frac{1}{2}$ by $1\frac{1}{2}$ to $2\frac{1}{4}$ in.; midrib angled beneath, tinged with red; nerves indistinct above, slender beneath, uniting close within the margin, interspaces reticulate.

76. **E. revoluta,** *Wight Ill.* ii. 17; *Ic.* t. 534; leaves lanceolate with a small obtuse point to ovate or broadly obovate and obtuse coriaceous margins often revolute, cymes terminal longish peduncled, flowers sessile congested at the ends of the branchlets, fruit spherical reddish size of a small cherry. *Bedd. Fl. Sylv. Anal. Gen.* cvii.; *not of Berg.* Syzygium revolutum, *Thwaites Enum.* 117.

NILGHIRI MTS., *Hb. Hohenacker.* CEYLON, in the Central Provinces, alt. 3–6000 ft. (Adam's Peak), *Walker, Thwaites*, &c.

A moderate-sized tree; branchlets terete or obscurely 4-gonous. *Leaves* shortly petioled, variable in size, polished above, dull and glaucous beneath. *Calyx* 4–5-toothed. *Petals* free, or cohering and falling off as a lid.—The Nilghiri specimens have the leaves smoother above and more conspicuously dotted, the nervation is not so prominent beneath. There is a small-leaved form of this in Wight's Herbarium collected in Ceylon by Col. Walker, and called *var. parvifolia*; the leaves are about 1 by $\frac{1}{2}$ in.

77. **E. oblata,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 493; leaves oblong or broadly lanceolate acuminate finely nerved, panicles terminal and axillary shorter than the leaves, petals united in a calyptra, berries round or transversely oval size of a cherry. *Wight Ill.* ii. 15; *Ic.* t. 622; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 67; *For. Fl.* i. 488. S. oblatum, *Wall. Cat.* 3569. S. pulchellum, *Wall. Cat.* 3566 *in part.* Jambosa pulchella, *Miq. Fl. Ind. Bat.* i. pt. i. 422. E. comosa, *Wall. Cat.* 3566 D; *l. c.* 3600 C (*under E. inophylla*).

ASSAM, *Jenkins*; KHASIA MTS., SILHET, CHITTAGONG, PEGU, and MARTABAN to TENASSERIM; PENANG and SINCAPORE, *Wallich.*—DISTRIB. Yunan.

A tree; branchlets terete, reddish-brown. *Leaves* 3–4 in., often with a long slender point, shining above, turning dark when dried; petiole $\frac{1}{4}$–$\frac{3}{8}$ in. *Cymes* trichotomous, on long peduncles. *Flowers* rather large, sessile. *Calyx-tube* about $\frac{1}{4}$ in., gradually tapering to the base; lobes 4 or 5, unequal, persistent. *Stamens* numerous, long; anthers with an apiculate connective.

78. **E. lævicaulis,** *Duthie*; leaves ovate-lanceolate acuminate nerves close uniting very near the edge, cymes terminal and axillary short contracted branches ascending, calyx-tube about $\frac{1}{3}$ in. turbinate lobes 5, fruit roundish or flattened at both ends size of a cherry.

MALACCA, *Maingay*, 753–2.

Branchlets terete, polished. *Leaves* 3–4 by 1–1½ in., chocolate-coloured and shining above, rusty-red beneath when dry; petiole ¼ in. *Calyx-lobes* distant. *Style* long, persistent.—Allied to *E. oblata*, but with smoother branchlets and narrower more contracted inflorescence.

79. **E. sylvestris,** *Moon in Wight Ill.* ii. 15; *Ic.* t. 532; leaves glabrous from lanceolate with an obtuse point to obovate or spathulate obtuse coriaceous, cymes corymbose crowded terminal or from the extreme axils on long peduncles, flowers small, calyx $\frac{1}{10}$ in., fruit spherical black-purple. *Bedd. Fl. Sylv. Anal. Gen.* cvii. Syzygium sylvestre, *Thwaites Enum.* 116. Calyptranthes Jambolana, *Moon Cat.* p. 39.

CEYLON; common up to an elevation of 3000 ft., *Walker, Thwaites.*

A very large tree; branchlets terete. *Leaves* about 4 by 1½–2½ in., shining above, rusty-coloured beneath, and minutely and densely punctate, closely nerved, the lateral nerves horizontal and uniting close within the margin, margins somewhat revolute; petiole ½–¾ in.—In Wight's figure the leaves are drawn too acute.

80. **E. assimilis,** *Thwaites Enum.* 116 (*Syzygium*); leaves petioled ovate-lanceolate or obovate more or less abruptly acuminate narrow at the base rarely rounded, cymes crowded at the ends of the branchlets half as long as the leaves, berries spherical. *Bedd. Fl. Sylv. Anal. Gen.* cvii.

CEYLON; up to alt. 5000 ft., *Thwaites.*

A moderate-sized tree. *Leaves* 2–5 by 1¼–2 in.; petiole ⅙–nearly ½ in. *Peduncles* obtusely 4-sided. *Flowers* rather large, about ½ in. in diam. *Petals* falling in one piece.—Differs from *E. Arnottiana* in the larger leaves and flowers, the united petals, and in the shape of the fruit; the nervation of the leaves is less close, and the marginal nerve is more distant from the edge.—A variety of this with larger leaves and flowers is also found in Ceylon.

81. **E. Neesiana,** *Wight Ill.* ii. 15; *Ic.* t. 533; leaves nearly sessile oblong-lanceolate obtusely acuminate subcoriaceous pellucid-punctate, cymes terminal and from the upper axils laxly corymbose, berry subglobose. *Bedd. Fl. Sylv. Anal. Gen.* cvii. Syzygium Neesianum, *Arn. in Act. Acad. Nat. Cur.* xviii. 355 (1836); *Thwaites Enum.* 117. Calyptranthes cordifolia, *Moon Cat.*

CEYLON; up to 3000 ft. alt., *Thwaites, Gardner.*

A good-sized tree. *Branchlets* terete. *Leaves* 3–4 by 1–1½ in. *Pedicels* half the length of the shortly turbinate calyx. *Flowers* small. *Petals* free or falling in one piece. *Berry* ⅝ in., crowned with the circular calyx-throat and the incurved acute lobes.

82. **E. microcalyx,** *Duthie*; leaves nearly sessile ovate or elliptic-obovate obtuse or shortly acuminate polished above nerves faintly impressed above prominent beneath, cymes terminal and axillary often exceeding the leaves, bracts small acute persistent, flowers very small, calyx-tube short subcylindrical $\frac{1}{10}$ in. or less lobes 4 distant subacute nearly equal, petals united.

MALACCA, *Griffith, Maingay*, 727 & 731.—DISTRIB. Borneo?.

Branchlets subterete. *Leaves* 2–4½ by 1¼–2¼ in., dark above when dried, reddish beneath; lateral nerves uniting some way within the margin. *Bracts* often in threes. —In Maingay's No. 727 the leaves are less distinctly nerved, the lateral nerves faintly unite close within the margin, and the flowers are rather smaller. No. 3354 of Beccari's Borneo may perhaps be referred to this species. Habit of *E. olivifolia.*

‡‡ *Leaves suborbicular.*

83. **E. cyclophylla,** *Thwaites MSS.* (*Syzygium*); leaves shortly petioled or nearly sessile broadly ovate to nearly orbicular very thick and coriaceous margins revolute, cymes terminal not exceeding the leaves, branches stout 4-gonous, berries nearly spherical crowned with the remains of the 4-fid calyx-limb.

CEYLON; Adam's Peak, *Thwaites* (C.P. 3915).

Leaves 2½–3 in. by 2 in., margins broadly and irregularly recurved in the dried specimens, black-dotted above, not glaucous beneath; midrib very stout; marginal nervation double. *Berry* about the size of a pea.—This differs from *E. revoluta* in the rounder more coriaceous leaves, shorter petioles, and the stouter inflorescence branches.

84. **E. sclerophylla,** *Thwaites Enum.* 118 (*Syzygium*); leaves small sessile very coriaceous obovate or nearly round cordate at the base glabrous above nerved beneath, midrib thickened towards the base, cymes about equal to the leaves, berries spherical size of a small cherry.

CEYLON; Central Provinces, alt. 6–8000 ft., Adam's Peak, *Thwaites.*

A moderate-sized tree; branchlets 4-gonous. *Leaves* ½–1 in. dull. *Berries* crowned with the cup-shaped calyx-limb, turning black.

85. **E. rotundifolia,** *Wight Ill.* ii. 17; leaves shortly petioled orbicular obtuse or obscurely acuminate subcordate at the base or attenuated coriaceous glossy and nerveless above, cymes terminal sessile few-flowered, berry spherical size of a small cherry. *Bedd. Fl. Sylv. Anal. Gen.* cviii. Syz. rotundifolium, *Arn. in Act. Acad. Nat. Cur.* xviii. 335; *Thwaites Enum.* 118.

CEYLON; Central Provinces, alt. 6–8000 ft., *Gardner, Thwaites.*

A small tree or shrub; young branches 4-gonous. *Leaves* ⅓–⅔ in. long, nerved beneath, margins revolute. *Calyx* obovate, shortly 5-toothed. *Berries* red turning to black.—Closely allied to the preceding species, differing chiefly by its petioled glossy leaves.

86. **E. calophyllifolia,** *Wight Ill.* ii. 17; *Ic.* t. 1000; leaves shortly petioled obtuse ovate obovate or orbicular very coriaceous, cymes terminal corymbose short-peduncled many-flowered, fruit ovoid or oblong. *Bedd. Fl. Sylv. Anal. Gen.* cvii. Syz. calophyllifolium, *Thwaites Enum.* 118.

NILGHIRI, *Wight, Adam, Gardner*; Sisparah, *Wight.* CEYLON, Adam's Peak, alt. 6–7000 ft., *Thwaites.*

A large spreading tree with a fine umbrageous head; young branches 4-gonous. *Leaves* glabrous, about 1 by ¾ in., reticulated beneath when dry, not dotted. *Calyx* repandly 4-toothed. *Petals* orbicular, falling together in one piece. *Fruit* succulent, dark purple, edible.

87. **E. oligantha,** *Thwaites Enum.* 118 (*Syzygium*); leaves small obovate obtusely and shortly acuminate or retuse narrowed towards the base faintly nerved dotted, heads terminal few-flowered shortly peduncled. *Bedd. Fl. Sylv. Anal. Gen.* cviii.

CEYLON; Ambagamowa district, alt. 3–5000 ft., *Thwaites.*

A small tree; upper branches 4-gonous, angles winged. *Leaves* ⅓–nearly 1 in. by ¼–½ in., shortly petioled. *Bracts* equal to about half the calyx-tube. *Calyx-tube* campanulate, much produced; lobes 4, rather conspicuous. *Berries* spherical, red turning black, size of a pea.

‡‡‡ *Leaves narrow.*

88. **E. olivifolia,** *Duthie*; leaves small shortly petioled spathulate obovate or lanceolate obtuse shining above dull beneath and densely glandular, lateral nerves few directed upwards, cymes about equal to or shorter than the leaves, flowers small shortly pedicelled. S. spathulatum, *Thwaites Enum.* 118; *not of Berg* (*Eug.*); *Bedd. Fl. Sylv. Anal. Gen.* cviii.

CEYLON, alt. 3–5000 ft., *Thwaites.*

A small tree. *Leaves* 1–1¾ by ⅓–⅔ in. *Berries* spherical, red turning to black, size of a pea.—This plant differs from *E. rubicunda* in the direction of the lateral nerves, and in the shape of the calyx-tube, which becomes more suddenly narrowed towards the base.

89. **E. rubicunda,** *Wight Ill.* ii. 15; *Ic.* t. 538; leaves shortly petioled narrow oblong attenuated at both ends obtuse coriaceous pellucid-punctate, primary nerves close, cymes terminal corymbose longer than the leaves, flowers minute, calyx repandly 4-lobed shortly turbinate. *Bedd. Fl. Sylv. Anal. Gen.* cviii.; *Dalz. & Gibs. Bomb. Fl.* 94. Syzygium rubicundum, *W. & A. Prodr.* 330. S. salicifolium, *Wall. Cat.* 3597; *not of Graham.*

TINNEVELLY DISTRICT, common up to 3000 ft. alt., *Beddome.*

A small tree, or large shrub; branchlets 4-gonous. *Leaves* 2½–3 by about ½ in.; petiole ⅙–⅓ in.—The leaves are narrower and more prominently nerved than in *E. lissophylla*, from which however Col. Beddome believes it to be not specifically distinct.

90. **E. cuneata,** *Wall. Cat.* 3598 (*Syzygium*); leaves narrow obovate-lanceolate obtuse tapering below into a short petiole lateral nerves horizontal, cymes from the terminal axils exceeding the leaves, flowers small, calyx-tube narrowly turbinate ⅕–¼ in. truncate above, petals calyptrate, berry size of a pea.

SILHET, *Wallich*; E. BENGAL, *Griffith*; KHASIA MTS., 3–5000 ft., *J. D. H. & T. T.*

Branchlets 4-gonous. *Leaves* about 1¾ by ½ in., smooth above, reticulate beneath. *Inflorescence* often leafy.

§§ *Cymes terminating previous year's branches.*

91. **E. papillosa,** *Duthie*; under surface of leaves young branches and pedicels clothed with rusty-coloured scurf, leaves large subsessile and somewhat amplexicaul obovate-oblong midrib and nerves very prominent beneath, cymes crowded at the extremities of year-old branches, calyx clove-shaped.

MALAY PENINSULA, *Maingay*, 737.

Branchlets terete or subtetragonous, stout. *Leaves* 7–9 by 3¾ in.; lateral nerves uniting conspicuously within the margin, dark above when dry, reddish beneath. *Inflorescence*-branches long, stout, compressed upwards. *Bracts* 2 at the base of each flower. *Calyx-tube* ¼ in.; lobes 4, prominent, subtriangular, obtuse, reflexed. *Petals* falling together.—One of Beccari's Borneo plants No. 2521, with larger leaves and flowers, has a similar clothing of reddish scurf.

92. **E. pustulata,** *Duthie*; leaves oblong acuminate narrowed below subcoriaceous nerves whitish prominent beneath distant uniting conspicuously within the margin, cymes terminating year-old branches, sepals acute, petals falling in one piece.

MALACCA, *Maingay*, (751).

Branchlets terete; rough with prominent glands, especially the upper branches, and the midribs and nerves of the leaves. *Leaves* 4½–7 by 1½–2¼ in., indistinctly

nerved above; midrib rounded beneath. *Inflorescence*-branches short, stout, 4-angular. *Flowers* about ¼ in.

93. **E. brachiata,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 488; leaves abruptly ovate or elliptic tip rounded or very shortly acuminate, panicles axillary or from the leafless axils much branched shorter than the leaves, flowers minute, calyx-tube obconic about $\frac{1}{12}$ in. lobes 4 shallow, corolla calyptrate, berry spherical. E. odorata? *Wight Ill.* ii. 16; *not of DC.* (*Syz.*). Syzygium brachiatum, *Miq. Fl. Ind. Bat.* i. pt. i. 460. E. cinerea, *Kurz in Pegu For. Rep. Append.* B. p. 50; *For. Fl.* i. 483. S. cinereum, *Wall. Cat.* 3576. S. ribesioides, *Wall. Cat.* 3553 A.

PEGU, *Kurz*; MERGUI, *Griffith*; AMHERST and PENANG, *Wallich*.—DISTRIB. Amboina.

A tree. *Branchlets* terete or subtetragonous; bark white. *Leaves* 2½–6 by 1¼–3 in., shortly petioled, glossy above, paler beneath; nerves finely impressed above, prominent beneath. *Bracts* ovate, acute, persistent. *Flowers* sessile in clusters of 6–9. *Berries* purplish to black.—The leaves of Wallich's specimens are much broader at the base than those of Wight. In Wallich's *S. ribesioides* the leaves are broader and less acuminate, the peduncles are shorter and the branchlets whiter.

94. **E. verecunda,** *Wall. Cat.* 3579 (*Syzygium*); leaves ovate with a long point, nerves close reticulate, petiole about ½ in., corymbs lax about half the length of the leaves, flowers very small, calyx with 4 shallow distant lobes broadly expanding above after flowering, petals calyptrate.

MALACCA, *Griffith*; PENANG, *Wallich*.

Branchlets terete, compressed at the nodes. *Leaves* 2½ by 1–1¼ in., pale yellow; petiole midrib and margin tinged with orange.—Wallich was inclined to connect this with his *S. concinnum*; the latter however differs by having shorter petioles, the leaves less distinctly reticulated, larger flowers, free petals, and the calyx-tube more gradually tapering to the base.

** *Cymes lateral, mostly from the scars of fallen leaves.*

† *Petals free.*

95. **E. nitida,** *Duthie*; leaves broadly ovate or oblong tip rounded or shortly acuminate polished above coriaceous, primary nerves few prominent beneath and uniting at some distance from the margin, cymes lateral chiefly from the leafless axils, calyx-tube spreading and recurved after flowering lobes prominent subpersistent, petals ?.

MALAY PENINSULA, *Maingay*, 728.

Branchlets terete, reddish-brown. *Leaves* 3–3½ by 2 in., black and shining above, rusty-red beneath, dots inconspicuous not pellucid, nerves indistinct above; petiole ¼–⅓ in.—Herbarium specimens resemble *E. brachiata*, but the flowers are larger, and the leaves broader and more shining.

96. **E. polyantha,** *Wight Ill.* ii. 17; *Ic.* t. 543; leaves obovate or oblanceolate obtusely acuminate cuneate at the base dark and shining above rusty-red beneath dots not pellucid, cymes short many-flowered axillary and from the leafless axils, flowers small, calyx rather deeply 4-lobed, petals free and expanding. *Not of Wall. Cat.* 3603; *not of Miq.* (*Syz.*). E. lucidula, *Miq. Fl. Ind. Bat.* i. pt. i. 444. Myrtus cymosa, *Blume Bijd.* 1086, *not of Spr.* (*ex Miquel* l. c.).

TENASSERIM, *Helfer*; MOULMEIN and MERGUI, *Griffith*.—DISTRIB. Java.

A slender tree, upwards of 80 ft. (Griffith MS.). *Branchlets* 4-gonous. *Leaves* the same size as those of *E. balsamea*, which it resembles in habit. *Petals* white.

97. **E. malabarica,** *Bedd. Fl. Sylv.* t. 199; *Anal. Gen.* cvii.; leaves obovate-spathulate or quite obcordate rarely oblong marginal looping inconspicuous, cymes from the old wood below the leaves rarely in the lower axils very short, flowers numerous very small bracteolate, calyx-tube with 4 indistinct triangular lobes, petals opening separately, fruit spherical about ¼ in.

Western Peninsula; WYNAAD, jungles, 2–4000 ft. alt., *Beddome.*

A middling-sized tree. *Branchlets* terete. *Leaves* 2–5 by 1–2¾ in., minutely dotted beneath; petiole ⅓–½ in. *Cymes* about ½ in. *Calyx-tube* more or less truncate in age, about $\frac{1}{12}$ in. diam. *Petals* orbicular with a slight claw, pointed, very soon deciduous.

98. **E. conglomerata,** *Duthie*; leaves obovate or oblanceolate rounded at the apex or shortly and obtusely acuminate tapering gradually to the base margins revolute, flowers from the leafless axils in dense sessile or subsessile clusters, calyx-tube broadly campanulate lobes 4 rounded persistent, petals free.

MALAYAN PENINSULA, *Maingay*, 745.

Bark of older branchlets grey; upper branchlets subtetragonous. *Leaves* 3–4 by 1–1½ in., sometimes subfalcate, coriaceous, dark and shining above, rusty-red beneath, minutely black-dotted; midrib stout beneath, lateral nerves few, prominent beneath and uniting distinctly in loops within the margin; petiole about ⅛ in. *Bracts* oblong, obtuse. *Filaments* short, stout.—Resembles No. 3326 of Beccari's Borneo plants, but the flowers are larger and the peduncles longer in the latter.

†† *Petals united.*

§ *Leaves alternate.*

99. **E. alternifolia,** *Wight Ill.* ii. 16; *Ic.* t. 537; leaves alternate suborbicular thick and coriaceous, cymes lateral longish-peduncled corymbose dense sometimes congested near the apex of year-old branches, fruit subspherical size of a cherry. *Bedd. Fl. Sylv.* t. 198.

KURNOOL, CUDDAPAH, and N. ARCOT districts, *Beddome*; BALAGHAUT, *Wight.* ASSAM, Nagari Hills.

A large tree. *Branchlets* terete. *Leaves* 3–8 in., rounded at the apex or rather suddenly obtusely acuminate, dark green and shining above paler beneath, minutely dotted; primary nerves numerous, uniting close within the margin; petiole 1 in. or more. *Flowers* yellowish-white, sweet-scented. *Calyx* viscid and shining, entire or with 4 very minute teeth. *Petals* calyptrate.

§§ *Leaves opposite.*

100. **E. tetragona,** *Wight Ill.* ii. 16; branchlets stout acutely 4-gonous, leaves ovate-oblong or nearly oval thick and coriaceous, lateral and marginal nerves very prominent beneath, cymes from the lower leafless axils shorter than the leaves, fruit globose size of a large pea. Syzygium tetragonum, *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. p. 66; *For. Fl.* i. 484; *Wall. Cat.* 3550. S. ficifolium, *Wall. Cat.* 3558. S. rameum, *Wall. Cat.* 3595.

SIKKIM, *J. D. H.*; BHOTAN, *Griffith.* KHASIA MTS., *J. D. H. & T. T.* SILHET, *Wallich.* AVA, *Kurz.*—DISTRIB. Yunan.

A large tree; branchlets with the angles often winged. *Leaves* 5–6½ by 2¼ in., attenuated at each end, dots minute but not pellucid; petiole about ½ in. *Calyx-tube* narrow below, suddenly enlarging at the throat; lobes small, rounded. *Petals* calyptrate.—The flowers are sweet-scented according to Wallich.

The branchlets are not so acutely 4-gonous in Wallich's *S. ficifolium* and *S. rameum*, and the leaves of the former are broader.

101. **E. occlusa,** *Miq. Fl. Ind. Bat.* i. pt. i. 460 (*Syzygium*); leaves on longish petioles elliptic obtusely acuminate acute at base coriaceous shining above paler beneath, lateral nerves distant indistinctly uniting within the margin, flowers rather large in condensed lateral panicles, calyx-tube broad above and with a truncate margin.

NICOBAR ISLANDS, *Kurz.*—DISTRIB. Java.

Branchlets terete or subcompressed upwards, light brown or whitish. *Leaves* 2–4 in., varying in width, rusty-brown when dried; midrib furrowed above; petiole about 1 in. *Panicles* shorter than the leaves, branches divaricate or subdeflexed. *Buds* globose. *Calyx-tube* upwards of ¼ in.—The calyx and corolla are apparently fused together in the calyptrate operculum. Under this species Mr. Kurz refers *E. cerasoides,* Roxb., *E. polyantha,* Wight, and the specimens 2394 & 2395 of Griffith's and Helfer's collection.

102. **E. operculata,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 486; leaves broadly ovate or elliptic rounded at the apex or obtusely acuminate narrowed below lateral nerves few distant prominent becoming fainter towards the margin, panicles from leafless axils lax divaricate, berry globose or ovoid. *Wight Ic.* t. 552; *Brandis For. Fl.* 234; *Kurz For. Fl.* i. 483. E. cerasoides, *Roxb. Hort. Beng.* 92; *Fl. Ind.* ii. 488; *Wight Ic.* t. 615; *Miq. Anal. Bot. Ind.* i. 27; *Fl. Ind. Bat.* i. pt. i. 443; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. 66; *For. Fl.* i. 484. Syzygium nervosum, *DC. Prodr.* iii. 260; *Mem. Myrt.* ii. 16; *Wall. Cat.* 3551 A & B; 3553 B & C (*under E. ribesioides*); *Benth. Fl. Hongk.* 119; *Thwaites Enum.* 417; *Miq. Fl. Ind. l. c.* 460; *Bedd. Fl. Sylv. Anal. Gen.* cvi. S. costatum, nodosum, and angkolanum, *Miq. Fl. Ind. l. c.* 448. Calyptranthes mangiferifolia, *Hance in Walp. Ann.* ii. 629. C. costata, *Ham. in Wall. Cat.* 3556. C. grandis and C. Tatna, *Ham. in Wall. Cat.* 3554, 3555.

SUB-HIMALAYAN forests from the JUMNA to ASSAM, ascending to 2000 ft. OUDH and GORAKHPUR forests, CACHAR, CHITTAGONG, PEGU, *Kurz.* CEYLON, up to 3000 ft. —DISTRIB. Indian Archipelago and S. China, Yunan.

A large tree; branchlets subterete or 4-gonous. *Leaves* 3–8 by 2–4 in., subcoriaceous, dots often black (in the dried specimens), rarely pellucid; primary veins 8–12, curving into a rather faint intramarginal vein; petiole ½–¾ in. *Inflorescence* often thyrsoidal. *Peduncles* long, acutely angled. *Flowers* small, greenish, in threes, nearly sessile, odorous. *Calyx* campanulate, with short obtuse lobes, or nearly truncate. *Petals* united and falling in one piece, calyptra often apiculate. *Berry* ¼–½ in., rugose, juicy. The wood is used for building and for agricultural implements. The fruit is eaten.

VAR. *Paniala*; berries oval. *E. Paniala,* Roxb. Fl. Ind. ii. 489. *Wight Ic.* t. 616; *Kurz For. Fl.* i. 483. Syz. Panealla, *Wall. Cat.* 3557? Calyptranthes cuneata, *Ham.*?—Chittagong, *Roxburgh*; Silhet, *Wallich*; Pegu, Rangoon, *McClelland.*—There is no fruit with Wallich's and Hamilton's specimens. Flowers in April, fruit ripens in June.

VAR. *obovata,* Kurz. For. Fl. i. 482; leaves obovate or oblanceolate, cymes more compact. Syz. obovatum, *Wall. Cat.* 3552, *not of DC.* S. vastum, *Wall. Cat.* 3561. S. polyanthum, *Thwaites; not of Wight.*—Silhet, Chittagong, Rangoon, *Wallich*; Ava, *Griff.*

103. **E. Stocksii,** *Duthie*; leaves elliptic-obovate rounded or obtusely acuminate at the apex indistinctly nerved dots not pellucid, cymes axillary and from the leafless axils half the length of or equalling the leaves, flowers small, petals calyptrate.

CONCAN, *Stocks.* WYNAAD, *Beddome.*

A lofty tree; branches acutely 4-gonous. *Leaves* 4–6 by 1¾–3 in., thin; lateral nerves few slender below curving upwards and becoming faint towards the margin.

Peduncles 1–2 in. *Flowers* about ⅛ in. *Calyx-lobes* 4, rounded or subacute.—Habit of *E. balsamea*, but the cymes are much longer peduncled and the leaves are not pellucid-punctate.

104. **E. balsamea,** *Wight Ill.* ii. 16; leaves ovate or ovate-lanceolate narrowed below acuminate subcoriaceous pale pellucid-punctate, lateral nerves prominent widely separated, cymes lateral short compact, flowers small, berry round. *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. 66; *For. Fl.* i. 485. Syz. balsameum, *Wall. Cat.* 3592. Memecylon floribundum, *Wall. Cat.* 4113.

SIKKIM, alt. 2000 ft., *J. D. H. & T. T.*; E. BENGAL, *Griffith*; PEGU, *Kurz*; SILHET, *Wallich, J. D. H., & T. T.* ASSAM, *Masters.*—DISTRIB. Yunan.

Branchlets subterete or obscurely 4-gonous. *Leaves* 3–5 by 1–1½ in.; petiole ⅜ in. *Inflorescence*-branches compressed, angular. *Calyx-tube* truncate. *Petals* united, or sometimes becoming free.

VAR. *angustifolia*; leaves narrowly elliptic-lanceolate, ½–¾ in. wide.—Khasia Mts., 2000 ft., *J. D. H. & T. T.*

105. **E. fruticosa,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 487; shrubby, leaves broadly oblong to oval acuminate finely nerved, flowers small in dense lateral panicles, berries small ovoid. *Wight Ic.* t. 624; *Kurz in Journ. As. Soc. Beng.* xlvi. pt. ii. 66; *For. Fl.* i. 485. S. fruticosum, *DC. Prodr.* iii. 260; *Mem. Myrt.* t. 19; *Wall. Cat.* 3559 *in part.*

SILHET and CHITTAGONG, *Roxburgh, Wallich*; PEGU, *Kurz*; TENASSERIM, *Helfer.*

A large shrub or small tree. *Leaves* variable as to size, very similar to those of *E. Jambolana*; petiole shorter. *Panicle*-branches divaricate, acutely angular. *Calyx* very short. *Corolla* calyptrate. *Berries* size of pea.—Resembles *E. polyantha*, Wight, in its inflorescence.

106. **E. Jambolana,** *Lam. Dict.* iii. 198; leaves ovate or oblong obtuse or more or less acuminate coriaceous closely nerved, panicles lateral below the leaves rarely axillary or terminal, calyx shortly turbinate limb truncate or obscurely 4-lobed, petals calyptrate, berry olive-shaped to globose purple from size of a pea to a pigeon's egg. *Ham. in. Wern. Soc. Trans.* v. 342; *Roxb. Fl. Ind.* ii. 484; *Wight Ic.* t. 535; *Benth. Fl. Austral.* iii. 283; *Bedd. Fl. Sylv.* i. t. 197; *Brandis For. Fl.* 233; *Kurz in Journ. As. Soc. Beng.* vol. xlvi. pt. ii. 67; *For. Fl.* i. 485. Syz. Jambolanum, *DC. Prodr.* iii. 259; *Wall. Cat.* 3560; *W. & A. Prodr.* i. 329; *Dalz. & Gibs. Fl. Bomb.* 93. E. frondosa, *Wall. Cat.* 3560 G; *not* 3590. E. Moorei, *F. Muell. Fragm.* v. 33. Calyptranthes Jambolana, *Willd. Sp. Pl.* ii. 975. C. capitellata, *Ham. in Wall. Cat.* 3560 B.

Common (wild or cultivated) and generally distributed throughout India in both peninsulas and in Ceylon; from the plains to 4–5000 ft.—DISTRIB. Malay Archipelago to Australia.

A tree, usually of considerable size with a thick and rather crooked trunk. *Leaves* 3–6 in., extremely variable in shape, smooth and shining, the numerous nerves uniting within the margin; petiole ½–1 in. *Cyme* short and compact or laxly paniculate. *Flowers* numerous, about the size of those of *E. operculata* or much smaller, sweet-scented. *Berries* often obliquely oblong.—The wood is whitish, close-grained, and durable; the bark affords brown dyes, and a kind of gum kino. The fruit is often eaten. Roxburgh mentions a variety having fruit of a superior quality, and as large as a pigeon's egg; probably the result of cultivation.

VAR. *caryophyllifolia*; leaves ovate-lanceolate with a long acumen, calyx shortly 4-toothed, berry globose size of a large pea. E. caryophyllifolia, *Lam. Dict.* iii. 198; *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 486; *Wight Ic.* ii. 553. E. calyptrata, *Roxb. Ic.* 1142? Syz. caryophyllifolium, *DC. Prodr.* iii. 259; *Wall. Cat.* 3562 *partly*, & 3551, C.; *Thwaites Enum.* 116. S. Jambolanum, var. microcarpum, *Thwaites Enum.* 417; *Wall. Cat.* 3562 C. Syz. lateriflorum, *Royle.* Myrtus Cumini, *Linn.*: *exclude*

syn. Rumph. & Burm.—Pluk. Alm. t. 274, 2. *Rheede Hort. Mal.* v. t. 29. *Rumph. Herb. Amb.* i. t. 41.

VAR. *obtusifolia*; leaves obtuse, berries oblong. E. obtusifolia, *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 485; *Wight Ic.* t. 620. Jambolifera pedunculata, *Gaertn. Fruct.* i. 78, t. 36.—*Rumph. Herb. Amb.* i. t. 42. The emargination in the leaves of Rumphius' figure is an error.

107. **E. tenuis,** *Wall. Cat.* 3570 (*Syzygium*); leaves ovate or ovate-lanceolate obtusely acuminate narrowed at the base coriaceous pale pellucid-punctate lateral nerves slender close interspaces finely reticulated, panicles from the leafless axils dense, calyx-tube broadly campanulate much produced lobes 4 shallow. Calyptranthes tenuis, *Ham. MSS.*

SUKANAGHAR, *Hamilton.*

Leaves $2\frac{1}{4}$–$2\frac{3}{4}$ by 1–$1\frac{1}{2}$ in.; margins slightly revolute; midrib slender, orange-coloured as well as the edges of the leaves; petiole about $\frac{1}{6}$ in. *Peduncles* $\frac{3}{4}$ in. or less. *Corolla* calyptrate. *Style* persistent, exserted.—The leaves have a close resemblance to those of *E. verecunda.*

108. **E. Heyneana,** *Wall. Cat.* 3599 (*Syzygium*); leaves narrowly oblong or elliptic obtusely acuminate narrowed at the base into a short petiole finely and closely nerved, cymes lateral from the scars of fallen leaves rarely axillary, calyx-lobes unequal, petals united, berries oblong. Calyptranthes Danca, *Ham. in Herb.* E. salicifolia, *Grah. Cat. Bomb. Pl.* 73; *not of DC.*; *not of Berg. or Wall. Cat.* 3597 (*Syz.*); *Wight Ill.* ii. 16; *Ic.* t. 539; *Dalz. Bomb. Fl.* 24 *excl. syn. Wall.*; *Bedd. Fl. Sylv. Anal. Gen.* cix.

WESTERN PENINSULA; beds of rivers in BERAR; BOMBAY GHATS and CONCAN, *Stocks*; CANARA, *Ritchie*; COORG, *Heyne*; SAGOR, *Vicary.*

A small tree or shrub. *Leaves* 3–5 by $\frac{3}{4}$–1 in., pellucid-punctate. *Cymes* lax, much branched. *Flowers* small, white. *Berries* $\frac{1}{2}$ in. or more in length, crowned with the cup-like calyx-limb.

E. salicifolia of Wight's Herbarium is certainly the *E. Heyneana* of Rottler's and Wallich's herbaria. Wallich's *E. salicifolia* is *E. rubicunda*, W. & A., a plant having very much the habit of this, but with the inflorescence terminal. The wood is used for rafters (Beddome).

VAR. *alternans*; cymes from the axils of the upper leaves. S. alternans, *Miq. in Herb. Hohenacker.*—Concan and Canara, *Stocks, Hohenacker.* The leaves are very like those of *E. pellucida.*

SECT. III. **Eueugenia.** *Flowers* solitary or in fascicles. *Petals* distinct. (To end.)

* Young parts and inflorescence fulvous or silvery pubescent. (To p. 504.)

† *Staminal disk broad.*

109. **E. Jossinia,** *Duthie*; leaves shortly petioled obovate-spathulate obtuse cuneate below coriaceous glabrous, peduncles axillary solitary or crowded at the end of the branches 1-flowered, pedicels and calyx rusty-pubescent, calyx-limb 4-lobed persistent, berry about the size of a sloe. E. cuneata, *Heyne in Wall. Cat.* 3625; *not of Wall. Cat.* 3598; *Bedd. Fl. Sylv. Anal. Gen.* cxii. Jossinia indica, *Wight Ill.* ii. 12, t. 122; *Ic.* t. 523; *Blume Mus. Bot.* i. 122; *Miq. Fl. Ind. Bat.* i. pt. i. 468.

SEVAGHERRY HILLS, TINNEVELLY DISTRICT, *Wight, Beddome*; COURTALLUM, *Wight.*

A small tree or shrub. *Leaves* 1–$1\frac{3}{4}$ by $\frac{1}{2}$–$\frac{5}{6}$ in., revolute at the edges; nerves inconspicuous above. *Peduncles* $\frac{3}{4}$ in. long. *Calyx-tube* subglobose; lobes rather unequal. *Petals* hairy, $\frac{3}{8}$ in. long.

110. **E. floccosa,** *Bedd. Fl. Sylv.* t. 200; young branches densely floccose, leaves ovate or suborbicular sometimes lanceolate obtuse densely floccose at length glabrous except on the ribs minutely dotted beneath coriaceous, edges revolute, flowers terminal in very short few-flowered cymes or solitary and large, calyx coriaceous densely pilose furnished at the base with 2 large bracteoles, petals exceeding the calyx-lobes white hairy at the back, fruit large size of a pigeon's egg densely woolly crowned with the persistent calyx-lobes.

S. TINNEVELLY GHATS above Calcad, 3–4000 ft., *Beddome.*

A large and beautiful tree. *Leaves* very thick, 3–5 by 2–3½ in.; nerves quite inconspicuous except in dried specimens, penninerved, with the usual marginal looping or occasionally 3-nerved at the base, the two lateral nerves not prominent; petiole densely floccose, ½–⅔ in. *Flowers* about 1 in. diam. *Disk* large, subglobose, woolly.

111. **E. codyensis,** *Munro in Wight Ill.* ii. 13; leaves short-petioled ovate-oblong or obovate tapering towards the base shortly obtusely acuminate, flowers nearly sessile clustered in terminal heads at the extremities of short abortive branches or axillary and solitary or few together, fruit globose 1–2-seeded.

NILGHIRI and KURG MTS., *Munro.*

A shrub with stout terete branchlets; young parts clothed with white pubescence. *Leaves* 1½–2½ by ¾–1¾ in., coriaceous, glabrous, shining above; dots minute, pellucid; lateral nerves slender, prominent, uniting within the margin; petiole ¼–⅓ in. *Calyx-tube* campanulate, silky-pubescent; lobes 4, broad, persistent, ciliate. *Petals* oblong, twice the length of the calyx. *Berries* about ¼ in. in diameter.—Judging from the specimen in Wight's Herbarium it seems to be closely allied to *E. elliptica*, Lam., of which it is perhaps only a variety; the leaves are rather longer petioled and the flowers larger.

Allied to this is *E. buxifolia*, Lam., a native of the Mauritius.

112. **E. lucida,** *Lam. Dict.* iii. 203; young parts and inflorescence covered with light-coloured cottony pubescence, leaves petioled broadly obovate or nearly orbicular revolute at the edges very coriaceous, flowers large solitary in the axils or collected 3 or 4 together at the ends of the former year's branches each with 2 small subacute bracts, calyx-lobes rounded unequal. Jossinia lucida, *DC. Prodr.* iii. 237. E. cotinifolia, *Jacq. Obs.* iii. 3 t. 53 *in part.* E. hypoleuca, *Thwaites MSS. C.P.* 3864 & 3865; *Bedd. Fl. Sylv. Anal. Gen.* cxii. Myrtus cotinifolia, *Spreng. Syst.* ii. 481 *in part.* M. Commersonii, *Spreng. l. c.* 479.

CEYLON; Wattekelle Hill, 5000 ft. alt., *Thwaites.*—DISTRIB. Bourbon, Mauritius.

Leaves 1½–2 by 1–1¾ in.; nerves indistinct above, slender beneath and uniting within the margin; petiole about ¼ in. *Flowers* upwards of an inch in diam. *Pedicels* ⅓ in. or less. *Calyx-tube* ¼ in. "Fruit obovate or globose glabrous crowned with the obtuse calyx-lobes" (Decandolle, l. c.).

113. **E. macrosepala,** *Duthie*; leaves petioled ovate or oblong-lanceolate subacute at the base obtusely acuminate or sometimes rounded at each end coriaceous, flowers lateral from leafless axils sessile solitary or in pairs each with 2 linear pilose bracts equalling or exceeding the calyx-tube, calyx-lobes 4 long narrowly lanceolate acute exceeding the obtuse petals.

N. CANARA, *Stocks.*

Upper branches stout, terete or compressed at the nodes; *bark* brownish. *Leaves* 3–4½ by 1½–1¾ in., shining a little above and of a reddish tinge; nerves inconspicuous above, slender but prominent beneath uniting within the margin. *Calyx-lobes* clothed with long spreading white hairs. *Petals* ovate, pilose at the back and ciliate at the margin. *Staminiferous disk* not so broad and square as in *E. elliptica*, Lam.

114. **E. calcadensis,** *Bedd. Ic. Pl. Ind. Or.* 35, t. 162; *Fl. Sylv. Anal. Gen.* cx.; young parts rusty-pubescent, leaves opposite or subalternate elliptic to subobovate obtuse very rugose on the upper surface but glabrous in age except the channelled midrib, peduncles axillary solitary about equal to the petioles 2- rarely 1-flowered, flowers showy white, ovary 2-celled with numerous ovules.

Calcad Hills in S. TINNEVELLY, up to 2000 ft., *Beddome.*

A small tree. *Leaves* 2½–3 by 1–1¼ in., coriaceous, not dotted; nerves inconspicuous above slightly prominent beneath, the primary ones joining within the margin; petiole ¼–⅜ in. *Pedicels* 1–1¼ in., with a subulate bract at the base of each. *Flowers* 1–1¼ in. in diam., with 2 small linear bracts at the base. *Calyx-lobes* rounded. *Petals* oblong ciliate ½–⅔ in. long. *Disk* suborbicular, densely woolly, covering the whole of the top of the ovary at the apex of the calyx-tube. *Stamens* inserted all over the disk.

†† *Staminal disk not enlarged.*

§ *Flowers pedicelled.*

115. **E. bracteata,** *Roxb. Hort. Beng.* 37; *Fl. Ind.* ii. 490; young parts and inflorescence rusty-pubescent, leaves shortly petioled ovate-oblong tapering or cuneate at the base obtusely acuminate glabrous when old coriaceous shining pellucid-dotted, peduncles axillary short 1-flowered solitary or 2–3 together or in fascicles with 2 small bracteoles under each flower, berry globose 1–2-seeded. *DC. Prodr.* iii. 264: *W. & A. Prodr.* i. 331; *Wight Ill.* t. 13; *Thwaites Enum.* 114; *Blume Mus. Bot.* i. 87 (*in part*); *Bedd. Fl. Sylv. Anal. Gen.* cx. Myrtus bracteata, *Willd. Sp. Pl.* ii. 969. M. coromandeliana, *Kön. MSS.* M. ruscifolia, *Willd. l. c.* 970; *DC. l. c.* 241; *Spreng. l. c.* 482. M. latifolia, *Heyne in Roth. nov. sp.* p. 232 (*not of Aubl.*). M. Heynei, *Spreng. l. c.* 482; *DC. l. c.* 241.

SILHET and Plains of S. India, especially near the sea; MADRAS, *G. Thomson, Wight, Hunter*; ANAMALLAY MTS., up to 3000 ft. alt., *Beddome*; CEYLON, Jaffna, *Gardner.*

A shrub or small tree. *Leaves* 1½–2 by about ¾ in. *Calyx-lobes* broad, unequal, reflexed after flowering. *Petals* ovate-oblong, twice as long as the calyx-lobes, pubescent at the back, margins ciliate.

VAR. *Roxburghii*; leaves broader, petioles longer, flowers larger. E. Roxburghii, *DC. Prodr.* iii. 271; *Wall. Cat.* 3621 (*in part*); *Hook. Journ. Bot.* i. 66, t. cxxiv.; *Miq. Fl. Ind. Bat.* i. pt. i. 441 (*in part*); *Blume Mus. Bot.* i. 87 (*in part*). E. zeylanica, *Roxb. Hort. Beng.* 92; *Fl. Ind.* ii. 490 *excl. syn. Willd.*; *W. & A. Prodr.* i. 331; *Arn. in Act. Acad. Nat. Cur.* xviii. 336 (1836). E. Willdenowii, *Wight Ill.* ii. 13; *Ic.* t. 545; *not of DC.*; *Thwaites Enum.* 114; *Bedd. Fl. Sylv. Anal. Gen.* cx.: *not of Wall. Cat.* 3623. Myrtus littoralis, *Roxb. in E. I. C. Mus.* t. 151. M. spicata, *Ham.* —Plains of S. India and in Ceylon.

Rottler's specimens in the Kew Herbarium, and those of Arnott from Ceylon named *E. zeylanica* have the leaves upwards of 4½ in. long. In Wight's figure the peduncles are incorrectly represented as 2-flowered.

VAR. *fasciculata*; leaves 2½–3 in., flowers fascicled more erect peduncles shorter. E. fasciculata, *Wall. Cat.* 3622; *Blume Mus. Bot.* i. 87.—SILHET, *Wallich.*

116. **E. Rottleriana,** *W. & A. Prodr.* i. 331; much branched, young shoots petioles peduncles and calyx covered with rusty-silky tomentum, leaves very narrow lanceolate tapering at both ends obtuse glabrous on both surfaces except when young pellucid-dotted, peduncles axillary or somewhat lateral 3–4 together or sometimes solitary filiform scarcely one-fourth the length of the leaves, bracteoles 2 under the calyx, calyx-segments 4 triangular ovate obtuse, petals 4 much longer than the calyx villous on the margin. *Wight Ill.* ii. 13; *Ic.* t. 100; *Bedd. Fl. Sylv. Anal. Gen.* cx.

Southern provinces of the WESTERN PENINSULA, *Wight, Beddome*; Courtallum, *Wight*.

A small tree or shrub. *Leaves* 1–2 by ¼–½ in.; petiole ¼ in. or less.—Col. Beddome mentions two distinct forms, the one with leaves 1–1½ by ½ in., the other 2 in. by ½ in. The former coming very near *E. Willdenowii* (of Wight).

117. **E. terpnophylla,** *Thwaites Enum.* 114 & 417; young parts and inflorescence rusty-pubescent, leaves lanceolate or oblong-lanceolate with a long acumen narrowing towards the base lateral nerves uniting at some distance from the margin, berry spherical usually 1-seeded. *Bedd. Ic. Pl. Ind. Or.* 67, t. 283; *Fl. Sylv. Anal. Gen.* cxi.

CEYLON; up to no great elevation, *Thwaites*.

A middling-sized tree; branchlets terete. *Leaves* 2½–5 by ½–2 in., membranous, faintly reticulate; lateral nerves prominent beneath, 5–8 on each side marginal often double; petiole ¼–¾ in. *Peduncles* axillary and terminal, short, few-flowered; pedicels about equalling the petioles. *Petals* white, twice as long as the rounded calyx-lobes. *Berry* downy, size of small cherry.

118. **E. xanthocarpa,** *Thwaites Enum.* 416; young branches and buds clothed with rusty pubescence, leaves elliptic-lanceolate obtusely acuminate glabrous acute at the base, midrib channelled above primary nerves prominent, pedicels axillary fasciculate rusty-pubescent about equalling the petioles, berry 1–4-seeded nearly spherical rusty-pilose tuberculate. *Bedd. Fl. Sylv. Anal. Gen.* cxi.

CEYLON; near the coast between Galle and Colombo, *Thwaites*.

A low tree. *Leaves* 2½–4 by 1–1½ in.; petiole ¼ in. *Berries* ¼–½ in., ochraceous.—Differs from *E. terpnophylla* in having more numerous primary nerves, in their being less prominent beneath, and uniting closer to the margin; and in the ochraceous berries which are often 2–4-seeded (Thwaites l. c.).

119. **E. rufo-fulva,** *Thwaites Enum.* 416; young parts covered with short reddish or tawny pubescence, leaves lanceolate acutely acuminate glabrous above (except when young) shining hairy covered beneath with short adpressed reddish or tawny tomentum at length glabrous, peduncles axillary fasciculate 1–3-flowered about equal to the petioles, calyx with small subulate bracteoles. *Bedd. Fl. Sylv. Anal. Gen.* cxi. E. terpnophylla, var β., *Thwaites* l. c. 114.

CEYLON, near Avishavelle, *Thwaites*.

A tree, 30–40 ft. *Leaves* 4–5 by 1–1½ in. or much narrower in some of Mr. Thwaites' specimens; petiole about ½ in. *Calyx-lobes* unequal, obtuse or subacute. "Differs from *E. terpnophylla* by the leaves being pilose beneath, and the primary nerves anastomosing nearer the margin" (Thwaites l. c.).

120. **E. argentea,** *Bedd. Fl. Sylv. Anal. Gen.* cix.; leaves ovate-elliptic to lanceolate with a long narrow acumen rounded at the base silvery pubescent beneath, peduncles filiform axillary pubescent, bracteoles 2 filiform exceeding the calyx-lobes persistent, fruit spherical sparingly clothed with short adpressed hairs.

S. INDIA, Wynaad, alt. 3000 ft., *Beddome*.

A small tree or shrub. *Leaves* 4–5½ by 1¼–1½ in.; nerves rather prominent beneath, lateral spreading nearly at right angles from the midrib and running into a regular looped nerve near the margin. *Peduncles* 1 in. long, from the old axils or axillary. *Flowers* ⅓ to nearly ½ in. across. *Fruit* about the size of a large cherry, black when dry, crowned with the persistent calyx-lobes.

§§ *Flowers sessile or subsessile.*

121. **E. floccifera,** *Thwaites Enum.* 115; leaves oblong-lanceolate acutely acuminate, young parts and inflorescence densely clothed with yellow tomentum, pedicels axillary short clustered, calyx-lobes 4 lanceolate much longer than the tube. *Bedd. Fl. Sylv. Anal. Gen.* cxi.

CEYLON; Reigam Corle, at no great elevation, *Thwaites.*
A small tree; *branchlets* terete. *Leaves* acutely acuminate, 4–8 by 1–2 in., at length glabrous; primary nerves rather prominent beneath, joined into a marginal looping one; petiole $\frac{1}{4}$–$\frac{1}{3}$ in. *Petals* white, equalling the calyx-lobes, $\frac{1}{3}$ in.

122. **E. fulva,** *Thwaites Enum.* 115; leaves elliptic or oblong abruptly and shortly acuminate rounded at the base smooth above prominently nerved beneath young parts and inflorescence clothed with yellow tomentum, flowers axillary and cauline small sessile crowded. *Bedd. Fl. Sylv. Anal. Gen.* cxi.

CEYLON; Pasdoon Corle, at no great elevation, *Thwaites.*
A small tree with terete branchlets. *Leaves* coriaceous, 4–6 by 2$\frac{1}{4}$–3 in., the young ones rusty-tomentose beneath; petiole about $\frac{1}{8}$ in.

123. **E. rivulorum,** *Thwaites Enum.* 115; leaves rather large lanceolate acuminate narrow at the base covered very slightly beneath with fulvous pubescence at length glabrous, flowers rather large sessile axillary and cauline, calyx-lobes 4 pilose externally rounded equalling the tube. *Bedd. Fl. Sylv. Anal. Gen.* cxi.

CEYLON; banks of streams in the Singherajah forest between Galle and Ratnapoora, at no great elevation, *Thwaites.*
A small tree with terete branchlets. *Leaves* 10–14 by 3–4$\frac{1}{2}$ in.; midrib stout longitudinally striated; principal nerves very prominent below and uniting to form a conspicuous intramarginal one; petiole about $\frac{1}{2}$ in. *Petals* oblong, pale purple, $\frac{1}{3}$–$\frac{1}{2}$ in.

124. **E. insignis,** *Thwaites Enum.* 416; young parts covered with white fugacious down, leaves rather large glabrous oblong acuminate smooth above ribs channelled paler beneath, primary nerves about 12 prominent anastomosing near the margin, interspaces smooth, flowers axillary and on the branches few sessile small, calyx with white hairs or floccose, fruit spherical. *Bedd. Fl. Sylv. Anal. Gen.* cxi.

CEYLON; Galpara in the Reigam Corle, *Thwaites.*
A low branching tree. *Leaves* 6–8 by 2–3$\frac{1}{2}$ in., rather acute at the base; petiole $\frac{1}{2}$–$\frac{2}{3}$ in. *Calyx-lobes* $\frac{1}{8}$ in. *Petals* rather longer than the calyx, ciliate. *Fruit* clothed with white hairs or floccose.

** *Whole plant nearly glabrous.*

† *Flowers sessile.*

125. **E. decora,** *Thwaites Enum.* 115; leaves oblong acuminate rounded at the base glabrous shining above paler beneath minutely reticulate, flowers sessile crowded axillary and cauline, berries transversely oblong 2-seeded. *Bedd. Fl. Sylv. Anal. Gen.* cxii.; *not of Wall. Cat.* 3608.

CEYLON; Galle, at no great elevation, *Thwaites, Champion.*
A small tree; young branches terete. *Leaves* 4–5 by about 2 in.; petiole $\frac{1}{8}$ in. *Flowers* white. *Berries* red or nearly black, $\frac{1}{2}$ by $\frac{2}{3}$ in.—Champion's single specimen from Galle has only one flower terminating a lateral branch; the calyx-tube is spa-

ringly clothed with adpressed hairs, the lobes large unequal rounded and ciliate, the petioles are glandular and ciliate at the edges.

†† *Flowers pedicelled.*

126. **E. amœna,** *Thwaites Enum.* 114; leaves sessile ovate-lanceolate acuminate cordate at the base or subamplexicaul glabrous coriaceous, flowers often terminal subfasciculate, pedicels much shorter than the leaves. *Bedd. Fl. Sylv. Anal. Gen.* cxi. E. Mooniana, *Wight. var. β., Thwaites Enum.* 114.

CEYLON, Kokool Corle and Delosbage District, up to 1500 ft., *Thwaites.*

A small tree; branchlets terete. *Leaves* 2–6 by $1\frac{1}{4}$–$2\frac{1}{4}$ in.; nerves inconspicuous above, more prominent beneath and uniting in a distinct marginal nerve with often a second fainter one nearer the edge. *Pedicels* $\frac{1}{2}$–$\frac{3}{4}$ in. *Bracts* ovate, acute. *Petals* 4, oblong, white, about $\frac{1}{4}$ in. in length, longer than the roundish calyx-lobes.—Some of Mr. Thwaites' specimens, and which he considers to be merely a state of this species, have the leaves much thinner, broader at the base, and with rather different nervation, the pedicels are shorter, and the calyx-lobes sometimes acute.

127. **E. Mooniana,** *Wight Ill.* ii. 13; *Ic.* ii. 551; *not of Gardner in Hook. Journ. of Bot.* ii. 352 (1843); shrubby, glabrous or the young shoots puberulous, leaves short-petioled ovate acuminate tapering at the base, peduncles axillary solitary or 2 together 1-flowered, flowers small, calyx-tube ventricose oblong, lobes 4 reflexed pointed, fruit globose or oblong size of cherry. *Thwaites Enum.* 114; *Bedd. Fl. Sylv. Anal. Gen.* cx.

Courtallum, *Wight*; NILGHIRI HILLS, *Hb. Hohenacker*; SEVAGHERRY HILLS, *Wight*; CONCAN, *Stocks*; CEYLON, up to 4000 ft., *Thwaites.*

A most variable species in the shape of the leaves and the length of the petioles and flower-stalks. *Leaves* $1\frac{1}{2}$–$2\frac{1}{2}$ by $\frac{3}{4}$–$1\frac{1}{2}$ in.; acumen short and obtuse, or prolonged to a fine point. *Pedicels* about $\frac{1}{3}$ in., axillary or from the old wood below.—It approaches *E. uniflora*, but the leaves are thicker and the pedicels are less slender.—Col. Beddome says (l. c.) "I have another species allied to this which may prove to be new (specimens imperfect) the peduncles are several-flowered."

VAR. *gracilis*; leaves longer, fruit oblong. E. gracilis, *Bedd. in Trans. Linn. Soc.* xxv. 217; Fl. Sylv. Anal. Gen. cx.—Anamallay Hills.

E. UNIFLORA, *Linn.*; *Miq. Fl. Ind. Bat.* i. pt. i. 441; leaves nearly sessile ovate sublanceolate glabrous rather thin and pellucid-punctate, pedicels axillary usually solitary and 1-flowered shorter than the leaves, calyx-lobes 4 reflexed, berries globose, torulose. E. Willdenowii, *DC. Prodr.* iii. 265; *Spreng. Syst.* ii. 480 (*Myrtus*); *Wall. Cat.* 3623. Syzyg. Michelii, *Lam. Dict.* iii. 203; *DC. Prodr.* iii. 263. Myrtus braziliana, *Linn. Sp. Pl.* 471. Plinia rubra, *Linn. Mant.* 243. P. pedunculata, *Linn. f. Suppl.* 253. E. zeylanica, *Willd. Sp. Pl.* ii. 963.

A native of S. America, becoming naturalised in Ceylon and parts of India.

VAR. *subcordata*; leaves slightly cordate at the base. *W. & A. Prodr.* i. 331; *Wight Ill.* ii. 13.

128. **E. mabæoides,** *Wight Ill.* ii. 13; shrubby, leaves short-petioled obovate-spathulate rigid glabrous shining above densely glandular, flowers on short pedicels axillary solitary or clustered on leafless branches, calyx-tube ventricose, limb 4-parted, berry spherical size of small cherry. *Thwaites Enum.* 114; *Bedd. Fl. Sylv. Anal. Gen.* cxi.

CEYLON; Central Provinces 4–7000 ft. alt., *Moon, Gardner, Thwaites.*

A shrub; much branched. *Leaves* resembling those of *Maba buxifolia*, $\frac{1}{2}$–2 by $\frac{1}{4}$–$1\frac{1}{4}$ in.

129. **E. microphylla,** *Bedd. Fl. Sylv. Anal. Gen.* cx.; glabrous in all its parts, young branches angled and winged, leaves opposite occasionally alter-

nate thickly coriaceous linear obtuse nerves inconspicuous, peduncles axillary solitary shorter than the leaves 1-flowered, fruit size of large grain of pepper.

Banks of rivers, Asamboo Hills, TRAVANCORE, 4–5000 ft. alt.
A small tree, much branched and very dense. *Leaves* $\frac{1}{3}$–$\frac{1}{2}$ by $\frac{1}{8}$–$\frac{1}{4}$ in., bright red, quite glabrous when young, prominently black-dotted; petiole $1\frac{1}{2}$ in.—I have seen no specimens.

130. **E. Thwaitesii,** *Duthie*; young parts pilose, leaves shortly petioled firm ovate obtuse rather abruptly acuminate subacute at the base, pedicels axillary fasciculate twice as long as the petioles, flowers small, berry spherical glabrous shining. *Bedd. Fl. Sylv. Anal. Gen.* cxii. E. concinna, *Thwaites Enum.* 416; *not of Phil. in Linnæa* xxviii. 640; *Bedd. Fl. Sylv. Anal. Gen.* cxii.

CEYLON, Ambagamowa District, *Thwaites.*
A tree; branchlets terete. *Leaves* sparingly pilose, at length glabrous, 3–5 by $1\frac{1}{2}$–$2\frac{1}{2}$ in.; petiole nearly $\frac{1}{4}$ in. *Pedicels* about $\frac{1}{2}$ in. or more. *Calyx-lobes* unequal. *Petals* ciliate, downy outside. *Berries* red, about $\frac{1}{2}$ in. in diameter.

131. **E. singampattiana,** *Bedd. Ic. Pl. Ind. Or.* 65. t. 273; leaves ovate or ovate-oblong retuse or subacute subcordate at the base coriaceous deep green above very pale beneath quite glabrous, flowers white in very short terminal crowded racemes, calyx and bracts slightly pubescent.

SINGAMPATTY HILLS, TINNEVELLY GHATS, moist forests, alt. 3000 ft., *Beddome.*
A small dense tree. *Leaves* about 3 by $1\frac{1}{2}$–2 in.; primary nerves numerous, forming a continuous looping one near the margin. *Flowers* about $\frac{1}{2}$ in. across. *Petals* prominently nerved.

DOUBTFUL AND EXCLUDED SPECIES.

E. CARYOPHYLLATA, *Willd.* (the Clove-tree) is a native of the Molucca Islands and not indigenous in India.
E. SP. (No. 2420 of Griffith's Herbarium) is too imperfect for description.
E. PULCHELLA, *Roxb.* is a native of the Molucca Islands.
E. WYNAADENSIS, *Bedd. in Mad. Lit. Soc. Journ. ex Ic. Pl. Ind. Or.* 35, t. 161; *Fl. Sylv. Anal. Gen.* cx.; young parts and inflorescence densely fulvo-tomentose, leaves oblong-lanceolate with a long blunt acumen quite glabrous on both surfaces when old, peduncles supra-axillary, calyx-lobes lanceolate acuminate a little longer than the corolla, bracts 2 linear much longer than the flowers, stamens inserted round the edge of the disk, ovary 2-celled, ovules pendulous from the apex about 4 in each cell.

WESTERN PENINSULA; Wynaad, alt. 2–3000 ft., *Beddome.*
A small tree or shrub. *Leaves* 3–$3\frac{1}{2}$ by 1–$1\frac{1}{4}$ in., rather thin; lateral nerves indistinct above, slender beneath and uniting into a continuous one within the margin; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. *Peduncles* $\frac{1}{2}$ in. *Fruit*?—This is probably, as Col. Beddome suggests, the type of a new genus intermediate between *Pimenta* and *Eugenia*. The materials at my disposal are too incomplete for the preparation of a proper generic description. The above is compiled from Col. Beddome's description of the plant.

SUBTRIBE BARRINGTONIEÆ. (By C. B. Clarke.)

9. BARRINGTONIA, *Forst.*

Trees. *Leaves* alternate, crowded towards the ends of the branches, entire or slightly crenate-serrate, pinnate-nerved, not dotted. *Flowers* in elongated terminal and lateral racemes, less often in interrupted spikes; bracts small, deci-

duous. *Calyx-tube* scarcely produced above the ovary; lobes 2–4 valvate, or 3–5 imbricate. *Petals* 4, rarely 5, much imbricate, somewhat adnate at the base to the staminal tube. *Stamens* very many, in several series, connate shortly into a tube at the base; filaments filiform, long, all bearing anthers. *Ovary* inferior, 2–4-celled, crowned with an annular disc; style long, simple, stigma small; ovules 2–8 in each cell, pendulous. *Fruit* fibrous or somewhat berried, globose ellipsoid or quadrangular, crowned with the calyx, by abortion 1-seeded. *Seed* ovoid or ellipsoid, without albumen; embryo large, exhibiting two layers, cotyledons nearly obsolete.—DISTRIB. Species 20; in tropical Asia, Africa, Australia and Polynesia, often near the sea.

SECT. **Butonica,** *Juss.* (gen.). *Calyx* valvate, 2–3- (rarely 4-) lobed. (BARRINGTONIA, AGASTA and BUTONICA of Miers).

* *Leaves entire.*

1. **B. speciosa,** *Forst. Char. Gen. Pl.* 76, t. 38; leaves large obovate, petals 2–2¼ in. *Linn. f. Suppl.* 312; *DC. Prodr.* iii. 288; *Roxb. Fl. Ind.* ii. 636; *Wall. Cat.* 3632, *excl.* B.; *Blume Bijd.* 1096; *W. & A. Prodr.* 333; *Wight Ic.* t. 547; *Miq. Fl. Ind. Bat.* i. pt. i. 485; *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 56, t. 10; *Kurz For. Fl.* i. 496. B. asiatica, *Kurz in Journ. As. Soc.* 1877, pt. ii. 70. B. ? macrophylla, *Miq. l. c.* 491. Mammea asiatica, *Linn. Sp. Pl.* 731. Agasta splendida, asiatica and indica, *Miers l. c.* pp. 60–64, tt. 11, 12.

CEYLON, *Thwaites* (Southern DECCAN PENINSULA probably not wild ex *Beddome*); ANDAMANS, *Kurz*; SINGAPORE, *T. Anderson*; on sea-coasts.—DISTRIB. The shores of Malaya, Australia and Polynesia.

Tree 30–50 ft., glabrous. *Leaves* often 15 by 7 in., obtuse, narrowed at the base, quite entire, sessile. *Raceme* short, erect; lower pedicels with a leaf-like bract, upper bracts much smaller. *Calyx* closed over the bud; lobes 2, 1¼ in., oblong. *Petals* white. *Ovary* 4-celled; ovules about 6 in each cell. *Style* often exceeding 4 in. *Fruit* 3 by 3 in., quadrangular or nearly ovoid, by abortion 1-seeded.—Mr. Miers founds a second genus on a drawing of Forster which represents the fruit as 4-celled. But the drawing appears to be taken from the fruit of *B. speciosa*, the very anomalous embryo having misled Forster to sketch in faintly four septa.

** *Leaves crenate-denticulate.*

2. **B. racemosa,** *Blume*; *DC. Prodr.* iii. 288; racemes pendulous pedicels ⅛–¼ in., calyx-tube in the bud broadly funnel-shaped segments 2–3, fruit ovoid. *Roxb. Fl. Ind.* ii. 634; *Wall. Cat.* 3634; *W. & A. Prodr.* 333; *Wight Ic.* t. 152, *including fruit*; *Bot. Mag.* t. 3831; *Dalz. & Gibs. Bomb. Fl.* 94; *Kurz For. Fl.* i. 496. B. speciosa, *Wall. Cat.* 3632 B. B. alba and rubra, *Miq. Fl. Ind. Bat.* i. pt. i. 487. Eugenia racemosa, *Linn. Sp. Pl.* 673. Stravadium album and rubrum, *DC. Prodr.* iii. 289. Butonica racemosa and alba, *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 65, 66, t. 13, fig. 1–17. B. rubra and inclyta, *Miers l. c.* pp. 70, 71, t. 14, fig. 1–3, 19.—*Rheede Hort. Mal.* iv. t. 6.

On sea-coasts. CONCAN; *Stocks.* QUILON, *Wight* No. 1064. From the SOONDERBUN to MALACCA; *Wallich, Kurz, Griffith, Maingay.* ANDAMANS; *Kurz.*—DISTRIB. Malaya and Polynesia.

An evergreen tree attaining 50 ft., glabrous. *Leaves* 10 by 3 in., cuneate-oblong, lightly crenate-denticulate; petiole ⅛–¼ in. *Racemes* 12–18 in., pendulous, flowers distant, pedicels ¼–⅛ in. *Calyx-lobes* ⅜ in., ovate. *Style* often 1½ in. *Fruit* 1¾ by 1½ in., ovoid, obscurely quadrangular below when quite ripe; in ripening attaining

nearly its full length before one-third its full breadth; in Maingay's examples nearly ellipsoid: exocarp very thick, fibrous.

3. **B. ceylanica,** *Gardn. MS.*; racemes pendulous pedicels $\frac{1}{2}$–$\frac{7}{8}$ in., calyx-tube in the bud broadly funnel-shaped segments 4 at first rounded rather than ovate. B. racemosa var. β., *Thwaites Enum.* 119. Butonica ceylanica, *Miers in. Trans. Linn. Soc. ser.* ii. *Bot.* i. 77.

CEYLON, south of the island abundant; *Thwaites.*

Treated by Mr. Thwaites as a var. of *B. racemosa*, and after specific separation by *Miers l.c.* reduced to *B. racemosa* again by *Kurz in Journ. As Soc.* 1877, pt. ii. 70. *Butonica intermedia, Miers l. c.* from New Caledonia differs by calyx-lobes 2–3, ovate.

4. **B. conoidea,** *Griff. Notul* 656, *Ic.* 635, 636 fig. 1; racemes suberect, calyx-tube in the bud campanulate somewhat urn-shaped, fruit ovoid with 8 wing-like descending processes from the base. *Kurz For. Fl.* i. 497. B. alata, *Wall. Cat.* 3633. Butonica alata, *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 70, t. 14, fig. 10–15.

MOULMEIN; *Wallich.* Coast forests of TENASSERIM; *Kurz.* MALACCA; *Griffith.*

An evergreen shrub or small tree (*Kurz*), glabrous. *Leaves* 7 by $2\frac{3}{4}$ in., oblong, narrowed downwards, at the very base cordate, crenulate-serrulate or nearly entire; petiole $\frac{1}{8}$ in., thick. *Raceme* 4 in., lax, but erect; pedicels $\frac{1}{4}$–$\frac{3}{4}$ in., glabrous (or somewhat puberulous, *Kurz*). *Calyx-tube* broad at the base, the 8 descending processes often manifest in the bud as figured by Griffith. *Calyx-lobes* usually 2, $\frac{3}{8}$ in., ovate. *Petals* and *style* as in *B. racemosa.* *Fruit* $1\frac{1}{4}$ by 1 in., conically ovoid, broadest at the very base and there 8-winged; wings produced downwards in 8 semi-cordate processes.—Mr. Miers l. c. has asserted that Griffith's figures are mixed, and that part of them refer really to B. alba, *Miers*: but Kurz has rectified this in *Journ. As. Soc.* 1877, pt. ii. 70. Griffith's figures agree more closely with the material than do Miers's.

SECT. **Stravadium,** *Juss.* (gen.). *Calyx* lightly imbricate, 3–5- (usually 4-) lobed. (STRAVADIUM and DOXOMMA of Miers).

* *Ovary 2-celled, whole calyx less than $\frac{1}{5}$ in.* (STRAVADIUM, *Miers*).

5. **B. acutangula,** *Gaertn. Fruct.* ii. 97, t. 101; leaves short-petioled cuneate-elliptic, racemes elongate pendulous, fruit quadrangular oblong equally narrowed towards and subtruncate at each end. *Roxb. Fl. Ind.* ii. 635; *W. & A. Prodr.* 333; *Miq. Fl. Ind. Bat.* i. pt. i. 488; *Dalz. & Gibs. Bomb. Fl.* 95; *Bedd. Fl. Sylv.* t. 204; *Brand. For. Fl.* 235; *Kurz. For. Fl.* i. 497. Eugenia acutangula, *Linn. Sp. Pl.* 673. Stravadium acutangulum, *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 80. S. rubrum, *Wall. Cat.* 3635. S. obtusangulum, demissum, Rheedii, globosum, Miers l. c. pp. 81, 82, 86 with syn., and probably (from the descriptions) several others of which examples authenticated by Mr. Miers have not been seen.—*Rheede Hort. Mal.* iv. t. 7.

Throughout INDIA from the HIMALAYA to CEYLON and SINGAPORE very common; no tree is more plentiful in the plain of BENGAL.—DISTRIB. Malaya; and North-West Australia (if *Stravadium gracile* Miers be considered the same species as by *Bth. Fl. Austral.* iii. 288).

Attaining 30–40 ft., glabrous. *Leaves* 5 by 2 in., minutely denticulate-crenate, narrowed into the petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Racemes* often 1 foot, glabrous, rachis not succulent; pedicels 0–$\frac{1}{4}$ in. *Calyx-tube* in the bud very short, funnel-shaped; lobes $\frac{1}{8}$ in., roundish, not longer on the fruit. *Petals* $\frac{1}{4}$ in., pink. *Filaments* long, usually red. *Fruit* 1–$1\frac{1}{2}$ by $\frac{1}{2}$–$\frac{3}{4}$ in., broadest in the middle, angles broad, rounded.—"Indian Oak" of the English denizens.

VAR. *pubescens*, sp. Miers, *l. c.* 83 (Stravadium); leaves pubescent on the nerves beneath, racemes and pedicels often more or less pubescent. Deccan Peninsula; frequent.

** *Ovary 4-celled, whole calyx more than ⅜ in.* (DOXOMMA, *Miers*).

† *Petiole short usually less than ⅓ in.*

6. **B. augusta,** *Kurz in Journ. As. Soc.* 1873, pt. ii. 233; *For. Fl.* i. 498; leaves cuneate-obovate, flowers sessile, calyx-tube in the bud acutely 4-winged. Stravadium augustum, *Wall. Cat.* 3637. Doxomma angustatum, *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 105, *excl. quotations of Jack and Helfer.* D. magnificum, *Miers l. c.* 106.

MOULMEIN and TAVOY; *Parish.* AMHERST; *Wallich.* TENASSERIM; *Kurz.*
An evergreen tree 30–50 ft. *Leaves* 14 by 7 in., narrowed to the base, minutely serrulate or nearly entire, glabrous; petiole ¼ in. *Raceme* sometimes 3 ft., always elongate with a thick rachis, pendulous; bract to each flower ¼ in., ovate or lanceolate, caducous. *Calyx* total length ⅓ in., minutely white-tomentose. *Petals* ¾ in., ovate, white (*Parish*). *Fruit* (half-ripe) 1 in., ellipsoid, somewhat obovoid, quadrangular, wings 4, narrow.

7. **B. Helferi,** *C. B. Clarke*; leaves linear-oblong, pedicels ⅕ in., calyx-tube in the bud funnel-shaped. Doxomma angustatum, *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 105, *partly.*

TENASSERIM and ANDAMANS; *Helfer* (Kew Distrib. No. 2426).
Leaves 20 by 4 in., narrowed to the base, minutely serrulate or nearly entire, glabrous; petiole ¼ in. *Raceme* exceeding 1 ft., pendulous, glabrous or minutely puberulous. *Calyx* total length ⅓ in., obscurely puberulous; tube in the bud terete or very obscurely quadrangular; whereas in *B. augusta* (to which Helfer's plant is referred by Miers) the wings are broad sinuous even in the bud.

†† *Petiole long, usually more than ½ in.*

8. **B. pterocarpa,** *Kurz in Journ. As. Soc.* 1873, pt. 234; *For. Fl.* i. 498; leaves obovate-lanceolate petiole often 1 in., spike 20 in. pendulous, flowers sessile, calyx-tube in the bud 4-winged. [The syn. D. magnificum *Miers,* quoted by *Kurz in Journ. As. Soc.* 1877, pt. ii. 70, does not belong.]

PEGU and MARTABAN to TENASSERIM; *Kurz* No. 3021.
An evergreen tree, 30–50 ft., glabrous. *Leaves* 10 by 3¼ in. (attain 16 in. ex Kurz), acute, attenuated at the base, minutely serrulate or nearly entire. Rachis of *spike* thick, glabrous or obscurely puberulous. *Calyx* total length ⅝ in., tube obscurely puberulous, distinctly 4-winged in the bud but much less so than in *B. augusta. Fruit* (ex Kurz) 2 in. oblong, quadrangular, angles with narrow but thick wings, fibrous-fleshy.—This seems very near *B. augusta*, as Mr. Kurz states.

9. **B. macrostachya,** *Kurz For. Fl.* i. 498, *including B. pendula Kurz l. c.*; leaves lanceolate petiole 1–3 in., spike 20 in. pendulous, flowers sessile, calyx-tube in the bud quadrangular or nearly terete. B. cylindrostachya, *Griff. Notul.* iv. 655. B. sarcostachys, *Miq. Fl. Ind. Bat.* i. pt. i. 490. Stravadium acuminatum, *Wall. Cat.* 3636. Careya macrostachya, *Jack in Mal. Misc.* i. 47. C. pendula, *Griff. Notul.* iv. 661. Doxomma pendulum, cylindrostachya, acuminatum, sarcostachys and macrostachyum, *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 99, 100, 102, 104, t. 15, fig. 9–15.

MERGUI; *Wallich, Griffith, Parish.* MALACCA; *Griffith, Maingay* No. 763.—DISTRIB. Malaya to Borneo.

An evergreen glabrous tree 30–40 ft. *Leaves* 12 by 3¼ in., much narrowed at either end, minutely crenulate-dentate; petiole longer than in the other species and dilated at the base. *Spike* with thickened rachis, glabrous or scarcely puberulous; bracts subulate, small, caducous. *Calyx* total length ¾–1 in., tube quadrangular, not winged in the bud. *Petals* high red, filaments white. *Fruit* 2¼ by 1½ in., ellipsoid, equally tapering to each end, roundish but with 4 distinct ribs.—Kurz has reduced all the synonyms above except *Careya pendula* of Griffith, of which he appears to have possessed no example and which he supposed to differ by having the flowers pedicelled. But in Griffith's *Careya pendula* the flowers are sessile or subsessile, and it does not appear to differ in any way from *Barringtonia macrostachya.*

10. **B. rigida,** *C. B. Clarke*; leaves long-petioled lanceolate, spikes 2–3 in. rigid erect sub-tomentose. Doxomma rigidum, *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 104.

MALACCA; *Maingay*, No. 767.

Leaves 12 by 3½ in., glabrous, acute at each end, entire or very nearly so; petiole 1½ in., not dilated at the base. *Spikes* from axils not close to the end of the branches, rusty brown. *Fruits* ⅞ by ½ in., sessile, approximated, erect, with 4 obtuse angles, nearly equally wide their whole length, subtruncate at apex and base, fibrous.—This species is quite unlike all others of the section: the fruits are more like those of sect. *Stravadium*, but Miers has satisfied himself that they contain 3 abortive cells: flowers unknown.

10. CAREYA, *Roxb.*

Trees or very small shrubs. *Leaves* alternate, crowded towards the ends of the branches, membranous, slightly crenate-serrate, pinnate-nerved, not dotted, narrowed at the base, sessile or petioled. *Flowers* large, in racemes or interrupted spikes. *Calyx-tube* campanulate or funnel-shaped, hardly produced above the ovary; lobes 4, ovate, imbricate. *Petals* 4, imbricate. *Stamens* very many, in several series, slightly connate at the base; filaments filiform, innermost and outermost without anthers. *Ovary* inferior, 4–5-celled, crowned by an annular disc; style long, simple, stigma small; ovules very many on axile vertical placentas, in two rows in each cell. *Fruit* large, globose, fibrous, crowned with the calyx; dissepiment absorbed or obscure. *Seeds* numerous, lying in pulp, ellipsoid; albumen 0; embryo large, cotyledons obsolete.—DISTRIB. Species 3; confined to India.

1. **C. herbacea,** *Roxb. Cor. Pl.* iii. 13, t. 217; *Fl. Ind.* ii. 638; a small undershrub, leaves cuneate-oblong or obovate serrulate. *DC. Prodr.* iii. 295; *Wall. Cat.* 3638; *Wight Ic.* t. 557; *Brand. For. Fl.* 237; *Kurz For. Fl.* i. 499; *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 96.

Terai of the HIMALAYA and KHASIA MTS., alt 0–1000 ft.; from KUMAON to CHITTAGONG; extending throughout dry jungles in the plain of Bengal; not rare: especially in sun-grass Terai jungles annually burnt in the dry season.

Rootstock woody, perennial; herbaceous leafy flowering shoots 6–8 in. *Leaves* 7 by 2¼ in., obtuse, long attenuate at the base, glabrous or obscurely puberulous; petiole 0–½ in. *Flowers* 1–2 rarely several on each shoot, terminal; peduncles ⅛–1½ in. grey puberulo-pubescent; bracts 2, ½–¾ in., linear, at the base of the calyx; flower subarticulated within the bracts. *Calyx* total length ¾ in.; tube campanulate, terete; lobes ovate, obtuse. *Petals* 1–1¼ in., greenish-purple, elliptic. *Fruit* 1–1½ in. diam., globose, crowned by the persistent calyx and often by the style.—*Careya herbacea, Griff. Notul.* iv. 660 is a confused description only partly referring to the present plant; perhaps mixed in the editing, as Miers suggests.

2. **C. arborea,** *Roxb. Cor. Pl.* iii. 14, t. 218; *Fl. Ind.* ii. 638; a tree, leaves obovate or oblong, spikes about 3-flowered, petals obtuse. *DC. Prodr.* iii. 295; *Wall. Cat.* 3640; *W. & A. Prodr.* 334; *Wight. Ill.* 99, 100; *Dalz. & Gibs. Bomb. Fl.* 95; *Bedd. Fl. Sylv.* t. 205; *Brand. For. Fl.* 236; *Kurz For. Fl.* i. 499; *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 97.—*Rheede Hort. Mal.* iii. 36.

Throughout INDIA, alt. 0–4000 ft.; from the Himalaya to Travancore and Tenasserim: no example from Ceylon.

Attaining 30–60 ft. *Leaves* 12 by 6 in., oblong or orbicular, obtuse or shortly acuminate, narrowed at the base, crenate-denticulate, glabrous; petiole 0–1 in. *Spikes* 3–8 in.; flowers usually few, sessile; bracts 3, unequal. *Calyx* total length $\frac{3}{4}$–1 in., terete, campanulate, obscurely pubescent; lobes ovate, obtuse. *Petals* $1\frac{3}{4}$ in., white, elliptic. *Filaments* red. *Ovules* in two rows in each cell of the ovary (*Kurz*). *Fruit* $2\frac{1}{2}$ by 2 in., globose, surmounted by an enlarged mouth having a depressed pit at the vertex within the calyx-teeth. *Seeds* $\frac{3}{8}$–$\frac{1}{4}$ in., ellipsoid.—Dissepiments of the *fruit* permanent, at least sometimes. C. orbiculata, *Miers l. c.* i. 98 t. 16, fig. 6–8 (founded on Griffith's example Kew Distrib. No. 2428 collected at Mergui) has the ovary slightly verrucose, apparently from the attack of some insect.

3. **C. sphærica,** *Roxb. Fl. Ind.* ii. 636; a tree, leaves obovate or orbicular, spikes many-flowered, petals acute white. *Wall. Cat.* 3639; *Wight Ic.* t. 147, 556; *Kurz For. Fl.* i. 500; *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 97, t. 16, fig. 9–15.

Mountains of CHITTAGONG, *Roxburgh.*

This is very doubtfully separable from the preceding species: Roxburgh says that in each cell of the ovary the ovules are in six rows (not in two as in *C. arborea*). Mr. Kurz does not appear to have seen the tree, and closely follows Roxburgh. Neither Col. Beddome nor C. B. Clarke have ever distinguished *C. sphærica* alive. Mr. Miers has set aside in the herbarium (as *C. sphærica*) examples collected as *C. arborea* by Wallich, Rottler, Ritchie and J. D. H., so that none of these could have distinguished the tree in the field.

11. PLANCHONIA, *Blume.*

Trees. *Leaves* alternate, crowded towards the ends of the branches, membranous, crenulate, pinnate-nerved, without dots. *Racemes* short, terminal; flowers greenish-yellow or white. *Calyx-tube* turbinate, scarcely produced above the ovary; lobes 4, imbricate. *Petals* 4, imbricate. *Stamens* very many, in several series, slightly connate at the base, innermost without anthers. *Ovary* inferior, 3–4-celled, crowned by an annular disc; style long, simple, stigma small; ovules many in each cell. *Fruit* (ex Miers and Kurz) large, 3–1-celled, fibrous, ovoid, crowned by the calyx. *Seeds* several, ellipsoid, lying in pulp; albumen 0; embryo horseshoe-shaped, cotyledons short.—DISTRIB. Species 2, extending from the Andamans to Australia.

1. **P. littoralis,** *Van Houtte in Fl. des Serres* vii. 25; glabrous, leaves obovate-oblong, flowers greenish on very short thick pedicels. *Miers in Trans. Linn. Soc. ser.* ii. *Bot.* i. 94; *Kurz For. Fl.* i. 500. P. littoralis, *Miers l. c.* Pirigarda valida, *Blume Bijd.* 1096. Gustavia valida, *DC. Prodr.* iii. 290; *Hassk. in Flora*, 1844, 595.

ANDAMANS, in the evergreen coast-forests; *Kurz.*

An evergreen tree 40–60 ft. *Leaves* 7 by $3\frac{1}{2}$ in., obtuse or scarcely acute, much narrowed at the base, denticulate; petiole $\frac{1}{8}$–$\frac{1}{2}$ in. *Raceme* short, terminal; flowers middle-sized. *Calyx-tube* $\frac{1}{4}$ in., top-shaped, obsoletely 8-angled; segments $\frac{1}{4}$ in., ovate, rounded. *Petals* 1 in., obtuse, reflexed. *Filaments* $1\frac{1}{2}$ in., purple.—(Description chiefly copied from Kurz).

DOUBTFUL GENUS.

Lencymmæa, *Presl. Epimel Bot.* 211, a genus supposed by Kurz to come next *Planchonia*, has opposite leaves and branches, and is probably stipulate (from Presl's description): at all events it cannot be allied to *Planchonia*.

ORDER LX. MELASTOMACEÆ. (By C. B. Clarke.)

Herbs or shrubs, more rarely trees, sometimes climbers. *Leaves* opposite or rarely whorled, generally petioled, entire or nearly so, often palmately 3–5–7-nerved from near the base to the apex (usually pinnate-veined in *Memecylon*); stipules 0. *Flowers* spiked panicled or corymbed, rarely solitary or clustered, regular, hermaphrodite. *Calyx-tube* united by vertical walls to the ovary, rarely nearly free; limb usually 4–5- (sometimes 3- or 6-) lobed, sometimes truncate, rarely falling off in a cap. *Petals* as many as the calyx-lobes, contorted in the bud, on the margin of the calyx-limb. *Stamens* as many or more than (frequently twice as many as) the petals, inserted with them; alternate stamens often shorter sometimes rudimentary, filaments bent inwards in the bud; anthers opening at the summit by one or two pores, rarely by slits down the face; connective often appendaged near the base by bristles tubercles or a spur. *Ovary* 4–5- (rarely 3- or 6-) celled (in *Memecylon* 1-celled); style simple, filiform, rarely short; ovules very many (except in *Memecylon*); placentas in the *Melastomeæ* axile, in the *Astronieæ* parietal, in *Memecylon* free central. *Fruit* included in the calyx-tube, capsular or berried, breaking up irregularly or by slits through the top of its cells. *Seeds* minute, very many (in *Memecylon* one only); albumen 0; cotyledons short (or in some of the *Memecyleæ* long thin convolute).—DISTRIB. Species 1800, tropical with a few subtropical; very many in America, many in south-east Asia, a few in Africa and Polynesia.

SUBORDER 1. **Melastomeæ.** *Ovary* 3–6- (usually 4–5-) celled. *Ovules* very many, on placentas radiating from the axis. *Seeds* very many. *Anthers* opening by a single terminal pore (rarely by 2).

TRIBE I. **Osbeckieæ.** *Seeds* curved through half a circle, minutely punctate.

Stamens all alike. Fruit capsular	1. OSBECKIA.
Stamens all nearly alike. Fruit a berry	2. OTANTHERA.
Stamens very unequal	3. MELASTOMA.

TRIBE II. **Oxysporeæ.** *Seeds* straight, oblong or cuneate, raphe often excurrent. *Ovary* with the vertex usually free conical. *Petals* more than 3. *Inflorescence* not scorpioid. *Fruit* capsular.

* *Inflorescence terminal* (*see also* Ochthocharis).

Panicles broad showy	4. OXYSPORA.
Large climber. Flowers umbellate	5. KENDRICKIA.
Panicles narrow. Flowers minute	6. ALLOMORPHIA.

** *Inflorescence axillary, stamens equal, flowers minute.*

Stamens 4	7. BLASTUS.
Stamens 10	8. OCHTHOCHARIS.
Stamens 8	9. ANERINCLEISTUS.

TRIBE III. **Sonerileæ.** *Seeds* straight, oblong or cuneate, often angular, raphe sometimes excurrent. *Ovary* flattened or depressed at the vertex. *Fruit* capsular.

Petals 3. Inflorescence scorpioid . . . . 10. SONERILA.
Petals 4. Flowers nearly sessile . . . . 11. SARCOPYRAMIS.
Petals 4. Flowers in a long-peduncled head. . . . . 12. PHYLLAGATHIS.

TRIBE IV. **Medinilleæ.** *Seeds* straight, cuneate or obovate, often angular. *Connective* often appendaged near the base. *Fruit* baccate.

* *Longer stamens having two long bristles attached to the base of the connective in front.*

Cymes lateral . . . . 13. MARUMIA.
Panicles terminal . . . . 14. DISSOCHÆTA.

** *Longer stamens having the connective at base variously appendaged but not with two long bristles in front.*

Four vertical plates on the ovary . . . . 15. ANPLECTRUM.

*** *Stamens equal or nearly so.*

Connective at base without bristles behind . . . . 16. MEDINILLA.
Connective at base with bristles behind . . . . 17. POGONANTHERA.

SUBORDER II. **Astronieæ.** *Ovary* 4–5-celled; ovules very many on parietal nearly basal placentas. *Seeds* very many. *Anthers* short opening by slits. *Fruit* baccate.

Calyx-tube smooth. Panicles terminal . . . . 18. ASTRONIA.
Calyx-tube verrucose. Cymes small . . . . 19. PTERNANDRA.
Calyx-tube with scales. Flowers solitary or clustered . . . 20. KIBESSIA.

SUBORDER III. **Memecyleæ.** *Ovary* 1-celled; ovules about 9 on a basal short free central placenta. *Stamens* equal; anthers short, opening by pores or short slits. *Berry* 1-seeded.—*Leaves* usually pinnate-nerved.

Stamens 8 . . . . 21. MEMECYLON.

1. **OSBECKIA,** *Linn.*

Herbs or shrubs, mostly erect and setose; branches commonly tetragonous. *Leaves* opposite or sometimes ternate, entire, subcoriaceous, 3–7-nerved. *Flowers* terminal, solitary capitate or panicled, purple mauve or white, often bracteate. *Calyx-tube* ovoid, carrying stellate hairs or pectinate scales; limb 5- or 4-fid, usually stellately hairy (in *O. aspera* and *O. Rheedii* with simple hairs). *Petals* 5-4. *Stamens* 10 or 8, equal or subequal; anthers oblong, truncate attenuate or beaked; connective not produced at the base, slightly swollen or with two tubercles. *Ovary* inferior, 4-5-celled, more or less adherent to the calyx, setose at the apex; style long, simple; ovules very numerous on placentas radiating from the axis. *Capsule* opening by 4-5 pores in its free vertex. *Seeds* very many, curved through half a circle, covered with minute elevated points.—DISTRIB. An eminently Indian genus; 29 out of the 32 species being found in India, two in Malaya, one in Australia; and one Indian species extending also to China and North Australia.

[With regard to the following generally accepted sections of *Osbeckia* founded primarily on the 4-fid or 5-fid flowers it should be premised that several *Osbeckias* which have the flowers normally 4-fid carry also a few 5-fid flowers on the same plant; and that sometimes a strong plant may produce all or nearly all the flowers 5-fid. This occurs eminently in *O. crinita* and in *O. cupularis.*]

SECT. I. **Amblyanthera.** *Perianth* normally 4-merous. *Anthers* not beaked. *Herbs* or small shrubs.

1. **O. truncata,** *Don ms.*; *W. & A. Prodr.* 322; hairs on the stem patent, flowers capitate often with two or four leaves close under the head, bristles on the apex of the ovary 16–20, fruit $\frac{1}{8}$–$\frac{1}{5}$ in. broad 8-ribbed ovoid-oblong. *Wight Ic.* t. 375; *Triana in Trans. Linn. Soc.* xxviii. 53. O. muralis, *Naud. in Ann. Sc. Nat. Ser.* 3. xiv. 56. O. Leschenaultiana, *Dalz. & Gibs. Bomb. Fl.* 92. O. zeylanica, *Steud. in Herb. Hohenack.* No. 577.

Throughout the DECCAN PENINSULA, alt. 0–4000 ft.; extending plentifully to CHOTA NAGPORE. EAST BENGAL, Mudhopoor; *C. B. Clarke.*

Stems 4–16 in., annual, 4-angled. *Leaves* 1 in., elliptic, subacute, 3-nerved, hairy on both surfaces, drying yellow; petiole $\frac{1}{12}$ in. *Bracts* ovate or oblong, glabrous on their backs. *Calyx-tube* and teeth with stalked stellate hairs; teeth erect, subpersistent. *Petals* less than $\frac{1}{4}$ in., purple. *Capsule* occasionally 5-celled.

VAR. *Kurzii*; plant scarcely 2 in. with very small leaves and flowers, capsule ovoid ribs altogether obscure.—Parasnath Summit, Behar, alt. 4200 ft.; *Kurz.*

2. **O. cupularis,** *Don ms.*; *W. & A. Prodr.* 323; flowers subcapitate often with two or four leaves close under the head sometimes more lax, bristles on the apex of the ovary very numerous, fruit rarely less than $\frac{1}{4}$ in. broad obscurely many-ribbed ovoid. *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 61; *Triana in Trans. Linn. Soc.* xxviii. 55. O. brachystemon, *Naud. l. c.* 57 *and* xiii. t. 7, f. 1; *Triana l. c.* 63. O. truncata, *Arn. in Hook. Comp. Bot. Mag.* ii. 308; *Naud. l. c.* 57. O. confertiflora, *Naud. l. c.* 59. O. Leschenaultiana, *Wight Ic.* t. 996; *Thwaites Enum.* 104 *partly*; *not of DC.* O. Wightiana, *Benth. in Wall. Cat.* 4074 (*not in Wall. Cat.* 4060).

Mountains of the southern part of the DECCAN PENINSULA and of CEYLON; *Wight* No. 1148 and 1095 (and No. 1093 with 4-fid and 5-fid flowers). Mysore; *Lobb.* Bababoodun Hills; *Law.* Nilghiris; *Hohenacker* No. 963 (named *O. Leschenaultiana*). (MERGUI? *Herb. Griffith*). Ceylon; *Gardner.*

Annual and biennial, drying yellow. *Stems* 8–20 in., tetragonous, glaucous upwards, with simple ascending often closely-adpressed hairs. *Leaves* 1–2 in., elliptic, subacute, 3- (or sub- 5-) nerved, hairy on both surfaces; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Bracts* ovate or oblong, glabrous on their backs. *Calyx-tube* and teeth with stalked stellate hairs; teeth patent subpersistent. *Petals* $\frac{3}{8}$–$\frac{3}{4}$ in., dark-purple or nearly white.

VAR. *erythrocephala*, Naud. in Ann. Sc. Nat. ser. 3. xiv. 58. O. Leschenaultiana, *Thwaites Enum.* 104.—Ceylon, alt. 6000 ft.; *Thwaites* No. 1576 and 284, *Gardner, Walker.*—Turns black in drying; stem below with deflexed hairs; stellate hairs about the inflorescence a rufous-brown; fruit sometimes large somewhat glaucous and slightly produced at the vertex; flowers in this variety seem always 4-fid.—Triana distinguishes (under the name *O. cupularis*) Wight's No. 1093 which has sometimes 5-fid flowers, the stamens 8, 9 or 10, from Wight's No. 1148 which he takes as *O. brachystemon*: but the two seem identical. Mr. Thwaites makes but one species here. Triana arranges the main sections of Osbeckia according as the flowers are 4-fid or 5-fid; he thus places *O. cupularis* in the 5-fid section at a great distance from *O. brachystemon*; then he says (under the head of *O. Leschenaultiana*) that *O. cupularis* has 4-fid flowers. *O. Leschenaultiana* is the name generally found in herbaria for this variable species, but Triana is right in saying that DC. meant by *O. Leschenaultiana* a very different plant.

3. **O. parvifolia,** *Arn. in Hook. Comp. Bot. Mag.* ii. 308; stems glabrous or with scattered small hairs, flowers few pedicelled with lanceolate bracts $\frac{1}{8}$–$\frac{1}{4}$ in. but not with large floral leaves, fruit $\frac{1}{8}$ in. broad ovoid obscurely ribbed. *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 58; *Triana in Trans. Linn. Soc.* xxviii. 53. O. Leschenaultiana, *Thwaites Enum.* p. 104, *partly.* O. zeylanica, *Bot. Reg.* t. 565.

CEYLON, *Walker* No. 332.

Small, woody, procumbent, with the habit of Thyme. *Leaves* $\frac{1}{4}$–$\frac{3}{8}$ in., ovate-subacute, nearly sessile, shortly setose on both surfaces, drying black. *Calyx-tube* and teeth with stalked stellate rufous hairs; teeth suberect, subpersistent.—Mr. Thwaites treats this also as a var. of *O. cupularis,* and it has all the appearance of being an alpine form of that plant.

4. **O. Rheedii,** *Thwaites Enum.* p. 104; stiffly shrubby, scabrous, leaves rigid 3-nerved harshly scabrous on both surfaces or glabrous above, flowers 1–4 clustered, calyx-tube with adpressed simple hairs, teeth long-lanceolate with erect simple hairs.

CEYLON; *Wight, Walker, Thwaites.*

Small, woody, much branched. *Leaves* 1 in., elliptic or oblong, narrowed at both ends; petiole $\frac{1}{8}$ in. *Petals* $\frac{2}{5}$ in., pale purple. *Fruit* $\frac{1}{5}$–$\frac{1}{4}$ in. broad, ovoid, truncate.—Mr. Thwaites states the flowers 4-fid, as they are in all the Kew examples; Triana puts the species in his section *Asterostoma* with 5-fid flowers without explanation. The plant differs from *Asterostoma* in the smaller flowers and (what is of more importance) in the anthers which are truncate at top and altogether those of section *Amblyanthera.*

SECT. II. **Genuinæ.** *Flowers* normally 4-fid, not large. *Calyx* campanulate, not produced or produced into a short neck in the fruit. *Anthers* beaked.

5. **O. chinensis,** *Linn.*; *Roxb. Fl. Ind.* ii. 224; leaves broadly oblong or linear suddenly narrowed at the base, flowers capitate, fruiting calyx-tube with few (or none) adpressed pectinate scales soon smooth shining. *Lour. Fl. Cochinch.* 228; *DC. Prodr.* iii. 141; *Bot. Mag.* t. 4026; *Triana in Trans. Linn. Soc.* xxviii. 53. O. angustifolia, *Don Prodr.* 221; *DC. Prodr.* iii. 142; *Wall. Cat.* 4067; *Pl. As. Rar.* t. 251; *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 69. O. japonica, *Naud. l. c.* 70. O. glabrata, *Wall. Cat.* 4071. O. myrtifolia, *Blume Mus. Bot.* i. 51. O. linearis, *Blume Mus. Bot.* i. 51, *with fig.*; *Wall. Cat.* 4969, *partly*; *Miq. Fl. Ind. Bat.* i. pt. i. 519; *Naud. l. c.* 70 *and* xiii. t. 7, fig. 4. O. zeylanica, *Naud. l. c.* 71. O. decora, *Wall. Cat.* 4070. Tristemma angustifolium, *Blume Bijd.* 1079; *DC. Prodr.* iii. 144.

HIMALAYA TERAI from KUMAON to BHOTAN, up to 4000 ft. alt. Abundant in NORTH and EAST BENGAL including ASSAM and KHASIA and thence to SINGAPORE. Also in CHOTA NAGPORE, alt 2000–4000 ft.—DISTRIB. Through China and Malaya to Japan and North Australia.

Stems 2 ft., branches descending, tetragonous, with adpressed hairs. *Leaves* commonly 2 in., narrow-oblong, sometimes 6 in., long-linear, in the Parasnath variety elliptic-oblong from a subcordate base, acute, 3–5-nerved, hairy on both surfaces; petiole less than $\frac{1}{8}$ in. *Bracts* ovate, on the back glabrous or with a few scattered hairs. *Calyx*-teeth lanceolate, glabrous, not keeled on the back, ciliate on the margin; hairs at their tips not spreading stellate. *Petals* $\frac{1}{2}$ in., mauve. *Anthers* with a beak about half their own length. Bristles on the apex of the *ovary* about 16. *Fruit* $\frac{1}{8}$ in. wide (or much larger in the Parasnath variety), ovoid, with a short neck, often glabrous, sometimes with few or several bristles, calyx-limb never persistent; in the Pegu examples the neck is much prolonged widened at the top.—The figure *Bot. Mag.* t. 4026 rejected by Bentham and Triana, admitted by Naudin, is the true plant: the anther is drawn too long-beaked for *O. octandra* to which Triana refers it, and the accompanying text states the anthers to be "longish beaked"; also the plant is stated to

have been imported from China where *O. chinensis* is common, *O. octandra* unknown. Triana appears to have rejected the figure because it shows 5 petals; the accompanying text states the calyx to be 4–5-fid. Now there are several instances of normally 4-fid Osbeckias having some or many 5-fid flowers; but there is no recorded instance of a normally 5-fid Osbeckia producing 4-fid flowers. The *Bot. Reg.* t. 542 is an inferior figure, but from similar reasoning is probably *O. chinensis* also.

6. **O. capitata,** *Benth. in Wall. Cat.* 4072; leaves ovate acute from a broad or cordate base subsessile, flowers capitate, calyx-segments lanceolate rounded on the back ciliate. *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 68; *Triana in Trans. Linn. Soc.* xxviii. 53. O. glauca, *Naud. l. c.* Osbeckioidea, *Griff. Ic.* 639.

EAST BHOTAN, Tassangsee, alt. 4500 ft.; *ex Griffith Journ.* KHASIA MTS., alt. 4000–5000 ft.; plentiful.

A perennial herb 8–20 in., branched from the base; branches tetragonous, with adpressed bristles. *Leaves* 1 in., hairy on both surfaces, 3–9-nerved, nerves deeply sunk on the upper surface in the dried specimens. *Bracts* ovate, acute, hairy on the back. *Calyx-tube* sometimes densely covered with clustered bristles, often with pectinate bristle-bearing scales at the apex only, sometimes even when young altogether glabrous. *Petals* $\frac{1}{2}$ in., mauve. *Anthers* with a beak more than half their own length. Bristles on the apex of the *ovary* about 16. *Fruit* ovoid, $\frac{1}{5}$ in. wide, often glabrous, sometimes more or less bristle-bearing; neck short, calyx-limb never persistent.

7. **O. zeylanica,** *Willd. Sp. Pl.* ii. 300; leaves oblong or elliptic narrowed at both ends, petiole 0–$\frac{1}{4}$ in., flowers capitate, calyx-tube with spreading stellately hairy scales persistent on the fruit. *Pluk.* t. 173, f. 4; *Roxb. Fl. Ind.* ii. 223; *Wall. Cat.* 4069; *W. & A. Prodr.* 322; *Miq. Fl. Ind. Bat.* i. pt. i. 519; *Thwaites Enum.* p. 104; *Triana in Trans. Linn. Soc.* xxviii. 53. O. serialis, *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 67. O. debilis, *Naud. l. c.* 65.

Tropical DECCAN PENINSULA, *Wight* No. 1143; Bababoodun Hills, Malabar; *Law.* CEYLON; *Thwaites.*

Erect, annual, 3–15 in.; branches ascending, tetragonous, with adpressed bristles or nearly glabrous. *Leaves* $\frac{3}{4}$–$1\frac{1}{4}$ in., hairy on both surfaces. *Bracts* very narrow. *Calyx-segments* keeled on their backs, often setose, ciliate on the margin, with stellate prominently-spreading bristles at their tips. *Petals* $\frac{3}{8}$ in., purple-mauve. *Anthers* with a beak more than half their own length. Bristles on the apex of the *ovary* about 16. *Fruit* $\frac{1}{8}$–$\frac{1}{5}$ in. broad, ovoid-oblong, calyx-limb deciduous.

VAR. *Helferi*; neck of fruit more produced upwards with 8 ribs, pectinate scales on the lower half of the fruit placed in three whorls encircling it horizontally.—Tenasserim and Andamans, *Helfer. Wallich*, No. 4069 partly.—O. zeylanica is united with *O. chinensis* Linn. by Kurz in *Journ. As. Soc.* 1877, pt. ii. 74.

SECT. III. **Ceramicalyx.** *Shrubs* or *stout herbs. Perianth* normally 4-merous. *Calyx* campanulate produced in fruit into a long or short neck or altogether truncate. *Anthers* large, produced into a very long beak.

8. **O. hispidissima,** *Wight Ic.* t. 1612; stems with reflexed strong bristles $\frac{1}{8}$–$\frac{3}{8}$ in., bracts to the pedicels round many extra ones without pedicels, calyx-segments oblong obtuse glabrous on the back strongly ciliate. *Triana in Trans. Linn. Soc.* xxviii. 53.

MYSORE; Wostara, *Cleghorn.* DECCAN PENINSULA; Munda Rani, *Wight* No. 1100.

Suffruticose, erect; branches stout, tetragonal. *Leaves* 4–6 in., lanceolate, narrowed at both ends, with strong bristles scattered on both surfaces or in one specimen nearly glabrous, nerves 3 strong and 2–4 faint; petiole $\frac{1}{8}$–$\frac{5}{8}$ in. *Corymbs* about 5-flowered; flowers dark crimson (Wight). *Calyx-tube* with scattered penicillate

bristle-bearing scales. *Anthers* with a beak much longer than half their length, with two tubercles at the base. Bristles on the apex of the *ovary* more than 50. *Fruit* $\frac{1}{4}$–$\frac{1}{3}$ in. broad, urn-shaped, entirely without neck; scales permanent, calyx-segments deciduous.

9. **O. stellata,** *Wall. Cat.* 4062; branches with short adpressed rigid hairs, calyx-tube most densely covered with stellate white yellow or brown hairs, teeth stellate hairy, neck of the fruit short or not exceeding half the length of the fruiting ovary dilated at the top. *DC. Prodr.* 142 *as to var. a.*; *Bot. Reg.* t. 674; *Hook. Exot. Fl.* i. t. 37; *Don Prodr.* 221, *partly.* O. crinita, *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 72; *Smith in Wall. Cat.* 4062; *Kurz in Journ. As. Soc.* 1877, pt. ii. 75. Melastoma crinita, *Roxb. Fl. Ind.* ii. 402.

HIMALAYA TERAI from KUMAON to BHOTAN, common; ascending the hills tc 5000 ft. alt. CHITTAGONG; *Roxburgh.*—DISTRIB. Canton.

Shrub 4–6 ft.; branches tetragonal. *Leaves* 3 in., lanceolate, 5-nerved, with short hairs on both surfaces or in hot moist valleys glabrous, narrowed or subcordate at the base; petiole $\frac{3}{8}$ in. *Flowers* large, rose-purple, clustered or in somewhat close corymbs; bracts ovate, acute, not very hairy on the back. *Calyx-tube* so densely clothed with hairs as to have a woolly appearance and texture. Bristles on the apex of the *ovary* about 20. *Fruit* $\frac{3}{4}$ by $\frac{1}{2}$ in. including the short neck, ovoid-oblong, densely woolly.—Don's description of *O. stellata* says the flowers are 4–5-fid; as 5-fid flowers are not known in our *O. stellata* but are frequent in our *O. crinita,* Don probably included under one name both our species. Naudin's descriptions of *O. stellata* and *O. crinita* only differ in assigning the long-necked fruit to *O. stellata*; therefore Naudin's *O. stellata* is our *O. crinita.* As Triana gives no descriptions or remarks, but quotes both Wall. Cat. 4062 and Naudin's *O. stellata* as one species, it cannot be guessed which of the two forms Triana took as *O. stellata.* The real distinction between *O. crinita* and *O. stellata* lies in the extreme thick woolliness of the covering of the calyx-tube in our *O. stellata*: consequently Sir J. Smith has written on the original Wall. Cat. 4062 (type spec.) "*Osbeckia? nov. sp.* (*crinita*)." Sir W. J. Hooker states (Exot. Fl. l. c.) that he changed the name from *O. crinita* to *O. stellata* and got Don to accept the name *O. stellata.* Subsequently Mr. Bentham gave the name *O. crinita* to the next species which has a less hairy calyx.

10. **O. crinita,** *Benth. in Wall. Cat.* 4066; branches with spreading hairs, calyx-tube with many stellate rufous-brown hairs teeth stellate hairy, neck of the fruit (in Wall. Cat. 4066 typical example not quite ripe) equalling or exceeding the fruiting ovary much longer than its own breadth. O. stellata, *Don Prodr.* 221, *partly.* O. stellata var. *β.*, *DC. Prodr.* iii. 142. O. stellata, *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 72.

SIKKIM and BHOTAN, alt. 4000–8500 ft., abundant. KHASIA MTS., alt. 3000–6000 ft. MOULMEIN, alt. 7000 ft.; *Parish.*

Shrub 4–8 ft., much branched. *Leaves* 2–4 in., lanceolate or elliptic-lanceolate, bristly on both surfaces, narrowed or subcordate at the base; petiole $\frac{1}{8}$–$\frac{3}{4}$ in. *Flowers* large (generally smaller than those of *O. stellata*), 4-fid and not infrequently 5-fid, purple or pure white, in somewhat close corymbs; bracts ovate, acute, usually very hairy on the back. Bristles on the apex of the *ovary* about 20. *Fruit* $\frac{3}{4}$ in. including the neck, ovoid, suddenly narrowed into the cylindric neck, often nearly glabrous.—The bushes of *O. crinita* at Darjeeling have usually a few 5-fid flowers at the summits of the branches: and there is a large-flowered white variety at 4000 ft. alt. which has all the flowers 5-fid. *O. speciosa, Herb. Hook.* (*not Don*) is a low-level form with spreading hairs on the stem but the stellate hairs of the calyx white or yellow not rufous.

11. **O. rostrata,** *Don Prodr.* 221; stem quadrangular glabrous or with scattered patent hairs, corymb compound large, fruit ovoid suddenly narrowed into a long cylindric neck. *DC. Prodr.* iii. 143; *Triana in Trans. Linn. Soc.* xxviii. 53; *Kurz in Journ. As. Soc.* 1877, pt. ii. 74. O. ternifolia, *Don Prodr.*

221; *DC. Prodr.* iii. 142; *Wall. Cat.* 4058. O. pulchella, *Wall. Cat.* 4059; *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 73. O. campestris, *Wall. Cat.* 4063; O. longicollis, *Wall. Cat.* 4065. Melastoma pulchella, *Roxb. Fl. Ind.* ii. 403.—Melastomacea, *Griff. Ic.* 638.

In the swamps at the foot of the Himalaya, from NIPAL to BURMA; abundant in NORTH and EAST BENGAL including ASSAM at 500–1000 ft. alt.; and (ex J. D. H.) ascends the hills to 4000 ft. alt.

Erect, 4–8 ft., virgate, hardly divided except towards the corymb. *Leaves* 3–8 in., 5-nerved, often in whorls of three, broadly lanceolate, glabrous or with long hairs scattered on both surfaces; petiole $\frac{1}{8}$–$\frac{1}{2}$ in. *Corymb* often with elongated branches; bracts ovate, glabrous or little hairy. *Calyx* when young glabrous or somewhat densely stellate hairy. *Petals* rose-purple. Bristles on the apex of the *ovary* 0 or about 20. *Fruit* $\frac{3}{8}$ in., generally glabrous finally, sometimes with scattered stellate hairs.—A species easily recognised by its habitat (Terai- or rice-swamps), its erect undivided stem and its rose-purple flowers. It varies greatly in hairiness.

VAR. 1. *pulchella*, Benth.; stem leaves calyx and apex of ovary absolutely glabrous.

VAR. 2. *longicollis*, Wall.; stem with hispid patent scattered bristles, leaves bristly-hairy on both surfaces, young calyx somewhat densely stellate-hairy, fruit with scattered stellate hairs.

VAR. 3. *O. marginulata*, Wall. Cat. 4064; stem and capsule with ascending hairs.—Burma.

SECT. IV. *A shrub. Perianth* large 4-merous. *Anthers* without beaks.

12. **O. gracilis,** *Bedd. in Trans. Linn. Soc.* xxv. 216; erect, slender, nearly glabrous, leaves $2\frac{1}{2}$–3 in. narrow lanceolate 3-nerved bristle-hairy on both surfaces, petiole $\frac{1}{7}$–$\frac{1}{5}$ in., peduncles with 2–3 large flowers, calyx-tube with a few remote bristles lobes ciliate ended by a bunch of bristles, anthers without beaks. (Resembling *O. longicollis* Wallich i.e. *O. rostrata* above).

DECCAN PENINSULA; Anamallay Mts.; alt. 4000 ft., *Col. Beddome.*

This species (only known from Col. Beddome's description here copied) is referred by Triana (*Trans. Linn. Soc.* xxviii. 54) to his section *Ceramicalyx*, which has very long beaks to the anthers. Col. Beddome's plant seems really nearer *O. octandra* DC. below.

SECT. V. **Asterostoma.** *Shrubs. Perianth* large 5-merous. *Anthers* attenuate upwards not beaked.

[The series of species following from No. 12 to No. 19 inclusive is quite unbroken: the flowers, anthers, fruit and hairs on the ovary are much the same in all. The species are separated by minute or trifling characters only; Triana makes more than the following eight, Thwaites less, out of the same material.]

13. **O. buxifolia,** *Arn. in Hook. Comp. Bot. Mag.* ii. 309; leaves $\frac{1}{3}$ in. subsessile ovate obtuse 3–5-nerved rufous woolly beneath nearly glabrous striolate above, calyx-teeth $\frac{1}{4}$–$\frac{1}{3}$ in. long-lanceolate acute rufous-villous without. *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 63; *Thwaites Enum.* p. 105; *Triana in Trans. Linn. Soc.* xxviii. 54.

CEYLON, alt. 6000–8000 ft.; *Walker, Gardner, Thwaites.*

Small, woody, branched; branches and innovations rufous shaggy. *Flowers* 1–3, clustered at the end of the branches. *Fruit* campanulate, truncate, rufous-hairy.

VAR. 1. *typica*; hairs on the calyx-tube with a long stem standing at right angles to the surface of the tube very stellate.

VAR. 2. *minor*, Thwaites No. 2618; hairs on the calyx-tube simple villous adpressed, flowers smaller than in the type.

14. **O. aspera,** *Blume in Flora,* 1831, p. 474; leaves oblong-lanceolate or elliptic-acute sparsely hairy on both surfaces or nearly glabrous beneath except on the nerves, calyx-tube strigose or sparingly clothed with pectinate bristle-bearing scales, segments $\frac{1}{5}$ in. ovate-oblong obtuse ciliate with a few clustered but scarcely stellate bristles on the top. *W. & A. Prodr.* 323 (*excl. syn.* O. glauca *Benth.*); *Wight Ic.* 377; *Thwaites Enum.* p. 105 (*as to var α. and β. only*); *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 74; *Triana in Trans. Linn. Soc.* xxviii. 54. O. Kleinii, *Arn. in Hook. Comp. Bot. Mag.* ii. 309; *Triana l. c.* O. minor, *Triana l. c.* 55. Melastoma asperum, *Linn.*; *DC. Prodr.* iii. 145 (*omitting syn.*).

DECCAN PENINSULA; *Wight.* CEYLON; at no great elevation, *Thwaites.*

A low shrub, woody below; branches often elongate, adpressedly scabrous. *Leaves* 1–2 in.; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Corymbs* usually 3–6-flowered. *Calyx-lobes* much longer than broad. *Fruit* $\frac{1}{4}$–$\frac{1}{3}$ in. broad, campanulate, truncate.—Triana founded his new sp. *O. minor* on Mr. Thwaites' No. 1569; and does not state in what particulars the species differs from *O. aspera, O. Kleinii* and *O. glauca*; but they must be very minute.

VAR. 1. *typica*; no stellate hairs on the calyx.

VAR. 2. *Kleinii*; several or very few stellate hairs on the calyx-tube, hairs at the summits of calyx-lobes clustered but hardly stellate.

15. **O. glauca,** *Benth. in Wall. Cat.* 4073; leaves elliptic narrowed or obtuse at either end softly hairy on both surfaces, calyx-tube with scattered small stellate hairs teeth $\frac{1}{12}$ in. obtuse glabrous on the back ciliate with one stellate hair at the summit. *Triana in Trans. Linn. Soc.* xxviii. 54. O. aspera, *Bot. Mag.* 5085.

TRINCOMALEE, TRAVANCORE, QUILON are the localities on the examples of *Wall. Cat.* 4073.

Small, woody, branching; branches adpressedly hairy, glaucous upwards. *Leaves* 1–1$\frac{1}{2}$ in.; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Calyx-lobes* much broader than long. *Fruit* $\frac{1}{4}$–$\frac{1}{3}$ in. broad, campanulate, truncate.—With larger flowers and more silky hairs than *O. aspera.*

16. **O. Walkeri,** *Arn. in Hook. Comp. Bot. Mag.* ii. 309; leaves elliptic narrowed at both ends margins not recurved hairy on both surfaces, calyx-tube adpressedly fulvous-hairy teeth narrowly lanceolate or linear uniformly fulvous-hairy without cilia or stellate hairs. *Thwaites Enum.* p. 105; *Triana in Trans. Linn. Soc.* xxviii. 54, *excl. var. β.* Bechetii.

CEYLON; alt. 6000–8000 ft.; *Walker, Gardner, Thwaites* No. 1571.

A small shrub; branches hispid. *Leaves* 1 in., 3-nerved; petiole $\frac{1}{8}$ in. *Flowers* 1–3, in terminal clusters. *Calyx-tube* with small clustered substellate hairs. *Fruit* $\frac{1}{4}$–$\frac{3}{8}$ in. broad, campanulate, truncate.—This species is close to *O. buxifolia,* Arn. from which it differs by the petioled leaves without recurved margins, and by the adpressed hairs on calyx-tube. But Thwaites' specimen No 2618 has leaves with recurved margins and adpressed hairs on the calyx-tube: and is called *O. buxifolia β. minor* by Thwaites, *O. Walkeri β. Bechetii* by Triana.

17. **O. Wightiana,** *Benth. in Wall. Cat.* 4060; silkily hairy towards the ends of the branches, leaves 5–7-nerved softly hairy on both surfaces elliptic or oblong usually acute, flowers 1–5 clustered, calyx-tube densely covered with pectinate scales fringed by long bristles, teeth $\frac{1}{5}$ in. ovate-oblong obtuse covered with simple or somewhat clustered hairs. *W. & A. Prodr.* 323; *Wight Ic.* 998; *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 63; *Triana in Trans. Linn. Soc.* xxviii. 54.

DECCAN PENINSULA, Southern Mountains. CEYLON, alt. 3000–5000 ft., *Thwaites* (No. 1570 var. δ.).

A branched shrub. *Leaves* 1½–3½ in.; petiole ⅛–¼ in. *Fruit* ⅓ in. wide, campanulate, truncate.—United by Mr. Thwaites with *O. aspera* above, from which it differs by the more pectinate-scaly calyx, and hardly by any other character.

18. **O. Leschenaultiana,** *DC. Prodr.* iii. 142; flowers 1–5 clustered with much rufous hair, leaves subsessile ovate obtuse or elliptic acute usually somewhat rounded at the base, calyx-tube densely clothed with stalked stellate rufous hairs teeth ¼ in. oblong obtuse with clustered bristles. *Triana in Trans. Linn. Soc.* xxviii. 54. O. Gardneriana, *Wight Ic.* 997.

NILGHIRI MTS., alt. 6000–8000 ft., frequent.

A branched shrub; stem usually patently hairy. *Leaves* 1–1½ in., 3–5-nerved, hairy on both surfaces. *Fruit* ⅓ in. wide, campanulate, truncate.

19. **O. rubicunda,** *Arn. in Hook. Comp. Bot. Mag.* ii. 309; branches scabrous-pilose, leaves elliptic or elliptic-oblong acute 5-nerved hairy on both surfaces petiole ⅛–¼ in., flowers 1–5 clustered, calyx-tube densely covered with stalked stellate hairs teeth lanceolate acute covered with simple and clustered bristles. *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 62; *Triana in Trans. Linn. Soc.* xxviii. 54.

CEYLON: *Wight, Walker, Gardner.*

A branched shrub. *Leaves* 1–2 in., usually rounded at the base. *Calyx-teeth* ¼ in. *Fruit* ⅓ in. wide, campanulate, truncate.—Triana reduces here *O. elliptica*, Naud. l. c.: but Naudin says his *O. elliptica* has short triangular calyx-teeth: while *O. rubicunda* only exists as a species upon its lanceolate acute calyx-teeth. Thwaites is probably right in referring *O. elliptica* Naud. to *O. cupularis var. erythrocephala* above.

20. **O. reticulata,** *Bedd. in Trans. Linn. Soc.* xxv. 216; branches densely clothed with adpressed hairs, leaves ovate acute petioled densely hairy on both surfaces and also alveolate-reticulate beneath, flowers 1–3 clustered, calyx-tube with large densely clustered bunches of hairs teeth short oblong obtuse densely ciliate scabrous and with a large terminal substellate hair. O. alveolata, *Bedd. Ic.* t. 168.

DECCAN PENINSULA; Anamallay Mts., above 6000 ft. alt.; *Col. Beddome.*

A branched shrub. *Leaves* 1–4 in., round or subcordate at the base, 5–9-nerved; petiole ⅓–1 in. *Fruit* ⅓ in. broad, campanulate, truncate.

21. **O. Moonii,** *Thwaites Enum.* p. 105; procumbent, rooting from the nodes, peduncles 1-flowered, calyx-teeth long-lanceolate acute with stellate hairs. *Triana in Trans. Linn. Soc.* xxviii. 55.

CEYLON; Colombo and Saffragam District; somewhat rare, *Thwaites.*

Stems elongate, roundish, with scattered lax hairs. *Leaves* 1–3 in., broad-elliptic, acute, 5-nerved, hairy on both surfaces; petiole ⅛–¾ in. Peduncles ½–1⅓ in., solitary or few and subumbelled, carrying small round or ovate bracts. *Calyx-tube* densely clothed with stalked stellate hairs standing at right angles to the surface. *Fruit* less than ¼ in. broad, campanulate or somewhat ovoid, truncate.

22. **O. aspericaulis,** *Hook. f. ms.*; *Triana in Trans. Linn. Soc.* xxviii. 55; stem erect simple scabrous with short hairs ending in a robust much-branched corymb, leaves 6 in. petiole 1¼ in., fruit ovoid truncate distinctly 10-angled.

TENASSERIM or ANDAMANS, *Helfer* No. 2244.

Leaves elliptic-lanceolate, rounded at the base, 5–9-nerved, hairy on both surfaces. *Bracts* lanceolate, caducous. *Calyx-tube* with scattered adpressed simple

hairs and a few compound hairs near the top, teeth long-lanceolate with simple hairs on the back. *Ovary* crowned with many long bristles. *Petals* $\frac{2}{3}$ in. *Fruit* $\frac{1}{3}$ in.

23. **O. octandra,** *DC. Prodr.* iii. 142 *ex Triana*; branches and branchlets woody, leaves oblong to lanceolate short-petioled 3-nerved sparingly scabrous or quite smooth on the upper surface, flowers scattered or 2–5 shortly pedicelled, calyx-teeth ovate-oblong, fruit scarcely $\frac{1}{5}$ in. broad obscurely ribbed or smooth sometimes with scattered stellate hairs. *Triana in Trans. Linn. Soc.* xxviii. 54 *excl. nearly all syn.* O. virgata, *W. & A. Prodr.* 323; *Thwaites Enum.* p. 105; *Naud. in Ann. Sc. Nat. ser.* 3. xiv. p. 61. O. polycephala, *Naud. l. c.* 67. O. Wightiana, *Benth. in Wall. Cat.* 4074. [Of the figures quoted by Triana, *Bot. Mag.* 2235 and *Wight Ic.* 998 do not refer to the present plant; *Bot. Mag.* 4026 has been referred above to *O. chinensis*; and *Wight Ic.* 376 *may* represent our var. *major* but does not give any idea of the typical *O. octandra,* DC.]

South Deccan Peninsula in and near the mountains; plentiful. Ceylon, up to 3000 ft. alt.; *Thwaites.*

Branches subquadrangular with adpressed hairs, or woody nearly round and glabrous. *Leaves* (in the typical *O. octandra*) not more than 1 in.; petiole $\frac{1}{8}$ in. *Calyx-tube* with scattered stellate hairs, teeth usually ciliate and with one stellate terminal bristle, sometimes perfectly glabrous.—This typical woody small-leaved shrub appears very distinct, but even the small-leaved branches carry sometimes large leaves also; and it thus graduates into—

Var. *major*; leaves larger often 2 in. frequently hairy on the upper surface often whitened beneath, heads flowers and fruit larger than in the type. O. virgata, *Wight Ic.* t. 376.—This variety is confounded by many authors with *O. cupularis*; but it differs in the perianth being more constantly 5-merous, and in its anthers which are not truncate nor suddenly narrowed into a very short beak, but gradually narrowed upward. It has also been mixed with *O. aspera,* but differs by the ovary having much fewer bristles on the top.

24. **O. nutans,** *Wall. Cat.* 4068; leaves narrowly lanceolate 3-nerved glabrous striolate above scabrous on the nerves beneath, flowers in small clusters, calyx-tube nearly glabrous with pectinate scales between the bases of the calyx-teeth, calyx-teeth large broad lanceolate glabrous ciliate on margin hairy at the vertex, fruit often nodding. *Triana in Trans. Linn. Soc.* xxviii. 54.

Subtropical Himalaya from Sikkim eastwards, alt. 500–2500 ft., frequent to the upper end of Assam; also on the northern base of the Khasia Mts.

A woody branching small shrub. *Leaves* commmonly $1\frac{1}{2}$ by $\frac{1}{4}$ in.; petiole $\frac{1}{8}$ in. *Flowers* mauve-purple, not very large. *Fruit* $\frac{1}{5}$ in. broad, campanulate, truncate.

25. **O. Wynaadensis,** *C. B. Clarke*; stems with adpressed short hairs, leaves 5 in. oblong-lanceolar petiole $\frac{3}{4}$ in., flowers in subterminal corymbs, calyx-tube with scattered flat setigerous scales otherwise glabrous teeth large broad-lanceolate glabrous shortly ciliate.

Deccan Peninsula, *Wight* No. 1099; Wynaad, alt. 4000 ft.; *C. B. Clarke.*

Leaves 5-nerved, scabrous-hairy on both surfaces. *Fruit* $\frac{1}{3}$ in. broad, ovoid, truncate, the free part of the ovary with a ring of short hairs (joined at their base into a narrow tube) near its top, otherwise glabrous.

26. **O. nepalensis,** *Hook. Fl. Exot.* t. 31; leaves 3–4 in. elongate oblong-lanceolate 5-nerved softly hairy on both surfaces petiole less than $\frac{1}{8}$ in., flowers in small rather close corymbs, calyx-tube with large flat scales fringed with bristles of which 5 prominently alternate with the calyx-teeth, calyx-teeth large broad-lanceolate glabrous ciliate. *DC. Prodr.* iii. 142; *Wall. Cat.* 4061;

Bot. Reg. 1475; *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 68 *and* xiii. t. 7, fig. 2; *Triana in Trans. Linn. Soc.* xxviii. 55; *Kurz in Journ. As. Soc.* 1877, pt. ii. 75. O. Chulesis, *Don Prodr.* 221; *DC. Prodr.* 143. O. speciosa, *Don Prodr.* 222.

Subtropical Himalaya from Nepal eastwards and in the Khasia Mts.; alt. 0–4000 ft., abundant.—Distrib. Ava.

A shrub; branches with adpressed hairs. *Bracts* ovate, glabrous, villous, centre of the backs villose. *Flowers* purple-mauve or white. *Fruit* ¾ by ⅓ in., campanulate, truncate, scales permanent.

2. OTANTHERA, *Blume.*

Shrubs. *Leaves* subcoriaceous, entire, 3–5-nerved. *Panicles* small, terminal and subterminal. *Calyx-tube* ovoid, carrying pectinate scales or simple hairs or subglabrous; teeth 5–6, deciduous. *Petals* 5–6, obovate. *Stamens* 10–12, alternate slightly longer; anthers opening by one pore at the summit, not beaked; connective not produced at the base, augmented by two auricles which are close to the anthers in the shorter stamens a little removed below them in the longer. *Ovary* half-inferior, apex carrying bristles, 5–6-celled; style filiform, simple; ovules very numerous, placentas axile, radiating. *Fruit* a berry. *Seeds* very many, curved through half a circle, minutely punctate.—Distrib. Species 2 or 3, extending from Burma to Singapore, Malaya, the Philippines and North Australia.

Otanthera comes between *Osbeckia* and *Melastoma*: the alternate stamens being auricled at the base exactly on the plan of those in *Melastoma*, but in a much less degree.

1. **O. moluccana,** *Blume in Flora,* 1831, p. 489; leaves sparingly shortly hairy beneath, small panicles of 3–5 flowers terminal and from one or two of the upper axils, fruit ovoid truncate with scattered shortly-stalked stellate hairs. *Blume Mus. Bot.* p. 56, t. 20; *Naud. in Ann. Sc. Nat. ser.* 3. xiii. 353; *Miq. Fl. Ind. Bat.* i. pt. i. 515. O. cyanoides, *Triana in Trans. Linn. Soc.* xxv. 56. Melastoma cyanoides *DC. Prodr.* iii. 146. M. moluccanum, *Blume Bijd.* 1078; *DC. Prodr.* iii. 146.—(*Rheede Hort. Mal.* iv. t. 43 quoted by Triana may be *O. rubro-limbata*).

Mergui; *Griffith* (Kew Distrib. No. 2253).—Distrib. Moluccas; Sierra Leone (Triana).

Stems scabrous. *Leaves* 2–2½ in., elliptic-lanceolate; petiole ¼ in. *Bracts* ovate, deciduous. *Petals* less than ½ in., white. *Fruit* ⅓ in. broad.

[*O. bracteata, Korth.* has the calyx-tube covered with long simple approximated ascending bristles, the broad bracts on the pedicels several close together subpersistent: otherwise it is much like *O. moluccana.* Kurz in *For. Fl.* i. 502 and in *Journ. As. Soc.* 1877, pt. ii. 75, says *O. bracteata, Korth.* is not unfrequent in Tenasserim. But Griffith's Mergui plant is clearly *O. cyanoides* Triana as appears from examples named by Triana's hand, while Kurz quotes Triana for *O. bracteata.*]

2. **O. nicobarensis,** *Teysm. & Binn. Nov. Pl. Hort. Bogor.* 29; flowers terminal and axillary in small panicles, calyx-teeth glabrous acuminate ciliate, fruit oblong from a rounded base purple.

Nicobars; collected by the Novara expedition and communicated by them to the Buitenzorg Botanic Garden; *Kurz* (*Journ. As. Soc.* 1876, pt. ii. 131).

A low shrub; branches tetragonous, subglabrous, but hairy at the nodes. *Leaves* ½–3 in., ovate or oblong-ovate, acuminate, rounded at the base, 5-nerved, shortly strigose on both surfaces; petiole ⅓ in. *Petals* 5, purple. *Stamens* subequal, anthers with two auricles added at the base.—*Not seen.*

EXCLUDED SPECIES.

O. RUBRO-LIMBATA (*Lachnopodium rubro-limbatum, Blume*) is figured by Link & Otto, *Ic. Pl. Sel.* t. 41, as a plant raised in European gardens from the "East Indies." It is more likely from Malaya than India, and Mr. Bentham in *Fl. Austral.* iii. 292 thinks it probably identical with *Otanthera bracteata.*

O. KOTI-GUEDA, *Naud. in Ann. Sc. Nat. ser.* 3. xiv. 64, is reduced to *O. Wightiana* by Triana; but Naudin describes its calyx-teeth short.

3. **MELASTOMA,** *Linn.*

Strigose or villous shrubs. *Leaves* petioled, oblong or lanceolate, entire, 3–7-nerved. *Flowers* terminal, solitary clustered or panicled, showy, purple, 5-(rarely 6–7-) merous. *Calyx-tube* with simple (rarely with penicillate) hairs, lobes deciduous. *Petals* equal in number to the calyx-lobes. *Stamens* twice as many as the petals, very unequal, alternate longer ones with purple anthers having the connective long-produced at base and terminating in two lobes, the shorter ones having yellow anthers the connective not produced but with two tubercles in front. *Ovary* more or less united to the calyx-tube, 5- (rarely 6–7-) celled, apex bearing bristles; style filiform, simple; ovules very numerous, placentas axile, radiating. *Fruit* coriaceous or somewhat berried, bursting irregularly. *Seeds* minute, very many, curved through half a circle, minutely punctate.—DISTRIB. Species 40 or 8 in South-East Asia and its islands, extending to North Australia and Polynesia.

* *Hairs closely adpressed at their base to the calyx-tube.*

1. **M. malabathricum,** *Linn.*; *DC. Prodr.* iii. 145; stems with short dense hairs adpressed or spreading, leaves with adpressed scabrous hairs above, scabrous on the nerves beneath and shortly hairy or nearly glabrous between them, bracts large elliptic narrowed into a stalk generally enclosing the buds, scaly hairs on the calyx-tube flat lanceolate, calyx-teeth long (or very long) ovate-lanceolate to narrow-lanceolate, glabrous within or with a few short hairs near the tip only. *Roxb. Hort Beng.* 33; *Fl. Ind.* ii. 405; *Wall. Cat.* 4040; *Bot. Reg.* t. 672; *W. & A. Prodr.* 324; *Wight Ill.* t. 95; *Dalz. & Gibs. Bomb. Fl.* 92; *Naud. in Ann. Sc. Nat. ser.* 3. xiii. 285; *Thwaites Enum.* 106 (*α. and β.*); *Kurz For. Fl.* i. 503, *not of Miq. Fl. Ind. Bat.* i. pt. i. 507. ? M. obvolutum, *Jack in Trans. Linn. Soc.* xiv. 3. Trembleya rhinanthera, *Griff. Notul.* iv. 677, *cf. Kurz in Flora*, 1871, p. 289.

Throughout INDIA very abundant, from sea-level up to 6000 ft. alt. "Indian Rhododendron" of the English denizens. Not towards the Indian Desert.—DISTRIB. Not found out of India: i.e. the above description has been narrowed to the Indian typical plant which is not found in Malaya, etc.

A spreading shrub 6 ft. *Leaves* 3–4 in., broad-lanceolate; petiole $\frac{3}{8}$ in. *Flowers* 1–5, clustered, mauve-purple. *Fruit* $\frac{1}{4}$ in. wide, short-ovoid, truncate, becoming pulpy within. *Calyx-teeth* often $\frac{1}{2}$–$\frac{5}{8}$ in., not shorter than the tube.—Mr. Bentham in *Fl. Austral.* iii. 293 proposes to include 24 species of Naudin under *M. malabathricum*, Linn.

VAR. *adpressum*, Wall. Cat. 4081; leaves narrow-lanceolate smaller than in *M. malabathricum* with a rigid more harshly scabrid pubescence. M. anoplanthum *Naud. in Ann. Sc. Nat. ser.* vol. xiii. 277.—Mergui to Singapore, and in Penang. The Java plant under this name in the Kew Herbarium is as different from *Wall. Cat.* 4081 as is any *Melastoma* in this section.

2. **M. polyanthum,** *Blume in Mus. Bot.* i. 52, t. 6; stems with short dense hairs adpressed or spreading, leaves with short hairs above adpressed or

subpatent, with short often soft hairs between the nerves beneath, bracts lanceolate or lanceolate-obovate much smaller than the buds and early deciduous, scaly hairs on the calyx-tube flat lanceolate, calyx-teeth triangular acute glabrous within shorter than the tube and often (*O. brachyodon, Naud.*) very short. *Naud. in Ann. Sc. Nat. ser.* 3. xiii. 287; *Miq. Fl. Ind. Bat.* i. pt. i. 502. M. malabathricum, *Jack in Trans. Linn. Soc.* xix. p. 4, *with fig.*; *Benth. Fl. Austral.* iii. 292, *partly*. M. brachyodon, *Naud. l. c.* 292.

SINGAPORE; *Sir R. Schomburgk, T. Anderson.*—DISTRIB. Throughout Malaya abundant to North Australia.

Only differs from *M. malabathricum* in the smaller bracts and shorter calyx-teeth; and is united with it by Mr. Bentham.

3. **M. normale,** *Don Prodr.* 220; branches densely shaggy, leaves with short patent hairs above and pubescent or villous beneath, calyx-teeth long lanceolate hairy within nearly to their base. *DC. Prodr.* iii. 145; *Naud. in Ann. Sc. Nat. ser.* 3. xiii. 289; *Kurz For. Fl.* i. 504. M. Wallichii, *DC. Prodr.* iii. 146; *Wall. Cat.* 4039, *partly*. M. napalensis, *Lodd. Bot. Cab.* t. 707.

NIPAL to BHOTAN, alt. 2000–6000 ft. KHASIA MTS., alt. 4000 ft., frequent.—DISTRIB. Ava, *Kurz*.

A large shrub, reaching 20 ft. in the interior Himalaya. *Leaves* 3–5 in., lanceolate; petiole $\frac{1}{4}$–$\frac{3}{4}$ in. *Flowers* 3–10, clustered; bracts not large nor enclosing the buds; petals a brighter more rosy mauve than in *M. malabathricum*. *Fruit* as in *M. malabathricum* or rather larger.—*M. velutinum* Seem. of Polynesia does not belong here.

4. **M. imbricatum,** *Wall. Cat.* 4047; stem densely clothed with adpressed ovate obtuse scales, leaves beneath with very small scabrous hairs, scales on the calyx-tube flat ovate acute, calyx-teeth ovate acuminate hairy within half-way down, fruit ovoid the margin at the top somewhat dilated. *Triana in Trans. Linn. Soc.* xxviii. 60, but the syn. *M. fasciculare Naud.* is doubtful.

EAST BENGAL; *Griffith* (Kew Distrib. No. 2242). PENANG, *Wallich*; TENASSERIM, *Helfer* (Kew Distrib. No. 2243).

Apparently very large. *Leaves* 8 in., broad-elliptic, acute; petiole 2 in. *Flowers* in terminal clusters of about 12; bracts not large. *Fruit* $\frac{1}{4}$–$\frac{5}{8}$ in., ovoid.

** *Hairs on the calyx-tube long, at their base spreading, then ascending or patent.*

5. **M. sanguineum,** *Sims in Bot. Mag.* t. 2241; stem with scattered long harsh patent hairs, leaves glabrous above scabrous beneath on the nerves and minutely hairy between them or nearly glabrous, calyx-teeth linear-lanceolate. *DC. Prodr.* iii. 145; *Don in Mem. Wern. Soc.* iv. 289; *Miq. Fl. Ind. Bat.* i. pt. i. 504; *Naud. in Ann. Sc. Nat. ser.* 3. xiii. 281. M. decemfidum, *Jack in Trans. Linn. Soc.* xiv. 6; *Roxb. Fl. Ind.* ii. 406; *Wall. Cat.* 4042; *DC. Prodr.* iii. 146; *Naud. l. c.* 282; *Kurz in Journ. As. Soc.* 1877, pt. ii. 75.

PENANG, SINGAPORE and MALACCA; *Wallich, Cuming, Griffith, Maingay.*—DISTRIB. Malaya and South China.

Leaves 4–5 in., narrowly lanceolate; petiole $\frac{1}{4}$–$\frac{3}{4}$ in. *Flowers* 1–4, clustered, often very large, rose-purple. Bristles on the *calyx-tube* often $\frac{1}{4}$–$\frac{1}{2}$ in., hair-pointed. *Fruit* $\frac{1}{2}$ in. wide and upwards.

VAR. *molle*, Wall. Cat. 4046; leaves 6 by $2\frac{1}{2}$ in. with scattered villous hairs on both surfaces. M. crinitum, *Naud. l.c.* 280.

6. **M. Houtteanum,** *Naud. in Ann. Sc. Nat. ser.* 3. xiii. 291; branches with dense adpressed or ascending villous hairs, leaves with scattered hairs above shortly villous beneath, calyx-teeth linear-lanceolate. *Kurz For. Fl.* i. 504.

PEGU, *Kurz*. TENASSERIM OF ANDAMANS; *Helfer* (Kew Distrib. No. 2241).

Leaves 4–5 in., broad-lanceolate; petiole ¼–¾ in. *Flowers* clustered. Hairs on *calyx-tube* ¼–½ in.—This species is essentially like *M. sanguineum*, but the indumentum of the stem and branches is of a widely different character: as to the leaves, the indumentum of *M. sanguineum* var. *molle* is exactly half-way between that of *M. sanguineum* and *M. Houtteanum.*

DOUBTFUL SPECIES.

As to the numerous species of *Melastoma* admitted by Triana in *Trans. Linn. Soc.* xxviii. 59, 60 as native in India, the names *M. triflorum*, Naud.; *ellipticum*, Naud.; *microphyllum*, Naud.; *lanuginosum*, Blume; *Royenii*, Blume; *longifolium*, Naud. are not found in the Kew collection. So far indeed from multiplying species out of the existing material, it would be better to reduce the whole of the Indian forms to three, viz., *M. malabathricum* (including *M. polyanthum* and *M. imbricatum*); *M. normale*; and *M. sanguineum* (including *M. Houtteanum*).

As to the 13 species of *Melastoma* described by Roxburgh, the first eight are octandrous; the next two have been admitted; the last two are outside the limits of the present Flora.

M. FINDLAYSONII, *Wall. Cat.* 4041, has not the place of collection given, and it is doubtful whether it was found within the limits of the Flora Indica. The Wallichian example shows the leaves and fruit, which might be those of *Osbeckia Leschenaultiana* above described; but Triana (assuming probably that had the stamens been all similar Wallich would have named it *Osbeckia* and not *Melastoma*) has called it *Dissotis Findlaysonii.*

M. CURVA, *Roxb. Fl. Ind.* ii. 406. "Shrubby, all the tender parts strigose, leaves petioled ovate-cordate 5–7-nerved finely serrulate, panicles terminal subcorymbiform supra-decompound, flowers 10-androus, petals cordate ciliate."—Chittagong. Neither figure nor specimen is known: the description is too short for safe identification.

4. **OXYSPORA**, *DC.*

Large spreading shrubs with drooping branches terminated by large, lax, almost naked panicles of rose-purple flowers. *Leaves* opposite, long-petioled, large, 5–7-nerved, ovate, acuminate, uppermost pair below the panicle often sessile much smaller and subcordate at base. *Panicle* long, sometimes narrow; branches decussate; bracts very small. *Calyx-tube* ovate-cylindric; teeth 4, short, triangular. *Petals* 4, subacute. *Stamens* 8, of which 4 are purple with longer filaments, 4 are yellow; anthers narrowed upwards, at top opening by one pore, produced at base, connective with or without appendage. *Ovary* inferior, 4-celled, apex glabrous; style simple, elongate; ovules very many, placentas axile, radiating. *Capsule* dry, elliptic, elongate, with 8 ribs. *Seeds* very many, falcate; raphe lateral, produced at top in front into a point.—DISTRIB. Species 4, whereof 3 are in East Bengal, 1 in Sumatra.

1. **O. paniculata,** *DC. Prodr.* iii. 123; branchlets panicles and nerves of the leaves beneath with some stellate pubescence, capsule long-elliptic very little narrowed below the calyx-mouth, seeds with a sharp right angle at the top of the back and a produced angular point at the top in front. *Wall. Pl. As. Rar.* t. 88; *DC. Mem. Melast.* t. 4 (*not correct as to the base of the connective*); *Wall. Cat.* 4076; *Miq. Fl. Ind. Bat.* i. pt. i. p. 556. O. vagans, *Bot. Mag.* t. 4553; *Lemaire Jard. Pl.* t. 79. Arthrostemma paniculatum, *Don in Mem. Wern. Soc.* iv. 299; *Prodr.* 222 (*partly*). Melastoma rugosa, *Roxb. MS.*

SUBTROPICAL and TEMPERATE HIMALYA, from NIPAL to BHOTAN; alt. 3000–7000 ft. KHASIA MTS.; alt. 3000–5000 ft., common. Abundant in the interior of Sikkim covering the hill sides.

Leaves 4–5 in. (in some examples attaining 14½ in.), ovate, acute; petiole 1–2 in., at its apex are some rough bristles. Longer *stamens* with the anther-cells diverging below the truncate base of the connective where the filament is attached. *Fruit* ⅜ by ⅛ in.

2. **O. vagans,** *Wall. Cat.* 4075, *partly*; branchlets petioles and nerves of the leaves beneath with some scattered patent villous hairs, capsule elliptic prominently narrowed below the enlarged calyx-mouth, seeds blunt-headed with a sharp right angle at the top of the back and a very short point at the top in front. O. vagans, *var. a. Wall. Pl. As. Rar.* p. 78; *Triana in Trans. Linn. Soc.* xxviii. 73; *Kurz For. Fl.* i. 505. Melastoma vagans, *Roxb. Hort. Beng.* 33; *Fl. Ind.* ii. 404. Homocentria vagans, *Naud. in Ann. Sc. Nat. ser.* 3. xv. 308.

MISHMEE; *Griffith.* KHASIA MTS., alt. 1000–3000 ft., common. CHITTAGONG; *Roxburgh.*

A rather smaller shrub than the preceding with the panicle generally more slender. Longer *stamens* with the anther-cells slightly produced at the base, connective having added to its base a linear spur.—*Wall. Cat.* 4075 contains some *O. paniculata* not any *O. cernua.*

3. **O. cernua,** *Triana in Trans. Linn. Soc.* xxviii. 73; glabrous, capsule elliptic truncate hardly narrowed below the calyx-mouth, seeds simply falcate. *Kurz For. Fl.* i. 505. O. vagans var. β. *Wall. Pl. As. Rar.* p. 78. Melastoma cernua, *Roxb. Hort. Beng.* 33; *Fl. Ind.* ii. 404. Allozygia cernua, *Naud. in Ann. Sc. Nat. ser.* 3. xv. 309.

MISHMEE; *Griffith* (Kew Distrib. No. 2262); CHITTAGONG, alt. 0–1000 ft.; *H.f. & T.*

A shrub, generally resembling *O. paniculata. Leaves* commonly 6 in., attaining 12½ in. in some examples; petiole 2 in. Rachis of the *panicle* somewhat sharply quadrangular at the base, but cannot be said to be 4-winged in any of the specimens at Kew (as Roxburgh states it to be). Longer *stamens* with the anther-cells shortly produced and diverging below the truncate base of the connective where the filament is attached.

5. KENDRICKIA, *Hook. f.*

A climber, ascending to the top of the highest trees, when in blossom tinging the forest red. *Leaves* opposite, petioled, oblong or obovate, obtuse, fleshy. *Flowers* terminal, in few-flowered umbels or solitary, large; peduncles stout, 2-bracteolate. *Calyx* urn-shaped, rose-purple; limb shortly 4-toothed, greenish. *Petals* 4, fleshy, a fine red. *Stamens* 8, equal; anthers at the attenuated summit opening by one pore, at the base shortly produced, connective having a horn about ⅛ in. at the base. *Ovary* inferior, 4–6-celled; style simple, filiform; ovules very many, placentas axile, fleshy. *Capsule* globose, 1-celled by absorption of the septa, opening at the apex by 4–6 valves. *Seeds* very many, minute, prismatic.

1. **K. Walkeri,** *Hook. f. in Gen. Pl.* i. 752; *Triana in Trans. Linn. Soc.* xxviii. p. 75, t. vi. fig. 70. Pachycentria Walkeri, *Thwaites Enum.* 107. Medinilla? Walkeri, *Wight Ill.* i. p. 217; *Gardn. in Calc. Journ. Nat. Hist.* viii. p. 11.

ANAMALLAYS; *Col. Beddome.* CEYLON, alt. 3000–5000 ft.; *Wight*; *Walker*; *Gardner, Thwaites.*

Stems in their lower part creeping up trees like ivy, hence flattened with the leaves

distichous; at the summits spreading pendent with leaves on all sides. *Leaves* 1–2 in., narrowed at the base, minutely furfuraceous or nearly glabrous, 3-nerved from the base with two additional nerves from the midrib much higher up; petiole $\frac{1}{4}$ in. *Petals* $\frac{3}{4}$ in.—" One of the most beautiful of Ceylon plants" (Thwaites).

6. **ALLOMORPHIA,** *Blume.*

Shrubs, tall or short. *Leaves* opposite, long-petioled, large, lanceolate ovate or orbicular, 15-nerved, glabrous or nearly so. *Panicles* terminal, compound, with small flowers in clustered whorls. *Calyx-tube* funnel-shaped or campanulate, limb of 4 very short lobes. *Petals* 4, rose or white, small. *Stamens* 8, nearly equal; anthers attenuated at the top with one pore, cells long-produced and diverging at their bases; connective without appendage. *Ovary* 3- (rarely 4-) celled enclosed by but nearly free from the calyx-tube; style filiform, simple; ovules very many, placentas axile, 2-fid. *Capsule* small, dry, urn-shaped or subcylindric, ribbed, opening at the top by 3–4 valves. *Seeds* very many, narrowly obtrapezoidal.—DISTRIB. Species 5: whereof 4 are from the Malay Peninsula and its attached islands; 1 from Canton.

1. **A. exigua,** *Blume in Flora,* 1831, p. 523; leaves lanceolate or ovate-lanceolate not cordate at the very base, pedicels in fruit not more than $\frac{1}{5}$ in., fruit ovoid 3-celled prominently 6-ribbed contracted at the top below the permanent calyx-rim. *Naud. in Ann. Sc. Nat. ser.* 3. xv. 310; *Triana in Trans. Linn. Soc.* xxviii. 74. Melastoma exigua, *Jack in Trans. Linn. Soc.* xiv. 10; *DC. Prodr.* iii. 149; *Wall. Cat.* 4048.

PENANG and MALACCA; *Wallich, Griffith,* &c.—DISTRIB. Philippines.

A tall shrub, nearly glabrous. *Leaves* often 9–10 in.; petiole 1–3 in. *Panicle* minutely rusty-pubescent; bracts $\frac{1}{4}$–$\frac{1}{3}$ in., lanceolate or narrow-spathulate. *Calyx-tube* most minutely hairy. Ripe *fruit* $\frac{1}{12}$ in. broad.

2. **A. umbellulata,** *Hook. f. ms.*; *Triana in Trans. Linn. Soc.* xxviii. 74; leaves lanceolate or elliptic-lanceolate often cordate at the very base, pedicels umbellulate in bud $\frac{1}{4}$ in. and more. *Kurz For. Fl.* i. 506.

TENASSERIM OR ANDAMANS; *Helfer* (Kew Distrib. No. 2260).

Shrub 10 ft. (Helfer); nearly glabrous except the panicle which is minutely pubescent and much more lax than that of *A. exigua.* *Flowers* larger than those of *A. exigua.* *Calyx-tube* in the young flowers funnel-shaped rather than campanulate; teeth more prominent. *Fruit* unknown.

3. **A. Griffithii,** *Hook. f. MS.*; *Triana in Trans. Linn. Soc.* xxviii. 74; leaves round obtuse cordate at the base, panicle elongate with small distant whorls which are shortly corymbose rather than umbelled or clustered.

MALACCA, *Griffith, Walker, Maingay* No. 775.

Almost stemless; rootstock woody. *Leaves* 5–6 in. long and more broad, glabrous or slightly puberulous beneath. *Panicle* about 12 in., rusty-pubescent. *Calyx-tube* campanulate, minutely hairy. *Fruit* unknown.

4. **A. hispida,** *Kurz in Flora,* 1871, 290; petioles thick 5 in. hispid bristly, leaves 8–9 in. ovate 9-ribbed sparsely bristly above more densely beneath especially on the nerves, panicles glabrous or with bristles at the divisions, pedicels slender about $\frac{1}{4}$ in. so that the flowers are in subsessile clusters, calyx-tube 4-ribbed carrying some long bristles short campanulate with minute teeth, ovary adnate to the calyx near the base only.

BURMA, Martaban; *Dr. Brandis* (Kurz).

Not seen: the above is copied from Kurz.

7. **BLASTUS,** *Lour.*

A shrub with round branches. *Leaves* opposite, petioled, oblong-lanceolate, 3–5-nerved. *Flowers* very small, in axillary clusters; peduncles short, without bracts. *Calyx-tube* oblong, puberulous, limb shortly 4-lobed. *Petals* 4. *Stamens* 4, equal; anthers attenuate at the top, opening by one pore, cells produced and diverging at their bases; connective without appendage. *Ovary* inferior, 4-celled, puberulous at the apex; style filiform, simple; ovules very many, placentas axile, paired. *Capsule* small, obscurely 4-furrowed, opening at the summit by four pores. *Seeds* very many, raphe long, testa long-linear, produced at each end much beyond the small oblong nucleus.

1. **B. cochinchinensis,** *Lour. Fl. Cochinch.* 527; *Seemann, Journ. Bot.* i. 281. Anplectrum parviflorum, *Benth. Fl. Hongk.* p. 116.

ASSAM; *Masters.* EAST BENGAL (prob. North-East Assam); *Griffith.*—DISTRIB. Hongkong and Formosa.

A shrub 6 ft., glabrous, innovations minutely puberulous. *Leaves* 3–4 in., lanceolate or elliptic-lanceolate; petiole $\frac{1}{4}$–$\frac{3}{4}$ in. *Peduncles* in fruit $\frac{1}{4}$ in. or less. *Fruit* less than $\frac{1}{8}$ in. broad.

8. **OCHTHOCHARIS,** *Blume.*

Small erect glabrous shrubs, branches round. *Leaves* opposite, petioled, oblong or lanceolate, 3–5-nerved, minutely denticulate-serrulate. *Flowers* minute in axillary clustered cymes, rarely in axillary and terminal lax cymes. *Calyx-tube* obovoid, smooth; teeth 5, small, persistent. *Petals* 5. *Stamens* 10, equal; anthers oblong, obtuse at the top opening with one pore, at the base shortly produced; connective without appendage. *Ovary* inferior, 5-celled, glabrous at the apex; style simple, filiform; ovules very many, placentas axile. *Capsule* globose, 5-valved, enclosed by the membranous calyx-tube. *Seeds* very many, irregularly club-shaped.—DISTRIB. Species 4 or 5, extending from Singapore to Borneo.

1. **O. paniculata,** *Korth. Verh. Nat. Gesch. Bot.* 247, t. 64; leaves opposite very unequal, panicle terminal. *Blume Mus. Bot.* i. 40; *Naud. in Ann. Sc. Nat. ser.* 3. xv. p. 307, *with fig.*; *Miq. Fl. Ind. Bat.* i. pt. i. 556; *Triana in Trans. Linn. Soc.* xxviii. 74. Melastoma oxyphyllum, *Benth. in Wall. Cat.* 4083.

SINGAPORE; *Wallich.*—DISTRIB. Malaya.

Branches quadrangular, nearly glabrous, becoming minutely rusty towards the panicle. *Leaves* attaining 5 in. by 2, lanceolate, 5-nerved, glabrous or minutely rusty on the nerves; petiole $\frac{3}{4}$ in. *Panicle* $1\frac{1}{2}$ by $1\frac{3}{4}$ in., rusty puberulous, short-peduncled; branches opposite, supported by small linear bracts $\frac{1}{16}$–$\frac{1}{5}$ in., the ultimate pedicels $\frac{1}{16}$–$\frac{1}{5}$ in. *Calyx-tube* campanulate, nearly glabrous; teeth 5, minute. *Petals* 5, $\frac{1}{5}$ in., ovate, subacute, rose-purple. *Fruit* (not ripe) $\frac{1}{5}$ in. diam. subglobose.

2. **O. javanica,** *Blume in Flora,* 1831, 523; leaves somewhat fleshy 3-nerved secondary nerves obscure, cymes 1 in. axillary, pedicels in fruit scarcely $\frac{1}{4}$ in. *Naud. in Ann. Sc. Nat. ser.* 3. xv. 307; *Miq. Fl. Ind. Bat.* i. pt. i. 556; *Kurz For. Fl.* i. 507. Melastoma? littoreum, *Wall. Cat.* 4087.

TENASSERIM, *Helfer* (Kew Distrib. No. 2277). SINGAPORE; *Wallich, Griffith* No. 2278, *T. Anderson, Maingay.*—DISTRIB. Java.

A small shrub, 2–3 ft. *Leaves* 2½ in., lanceolate or narrow lanceolate, narrowed at both ends, sparsely minutely bristle-serrate; petiole ¼ in. *Fruit* $\frac{1}{5}$ in. diam., subglobose.—The closely allied Malayan species have the cross secondary nerves very conspicuous; by which they differ from the present fleshy seashore plant.

9. **ANERINCLEISTUS,** *Korth.*

Large villous shrubs; branches round. *Leaves* petioled, ovate or lanceolate, entire, 5–7-nerved, with scattered hairs above, villous beneath. *Flowers* minute (in very small axillary clusters in the Indian species). *Calyx-tube* campanulate, densely hairy; lobes 4, very small. *Petals* 4, minute, glabrous. *Stamens* 8, equal; anthers attenuate at the top, opening with one pore, scarcely produced at the base; connective with or without a short spur. *Ovary* nearly free, 4-celled; style filiform, simple; ovules many. *Capsule* opening by 4 large pores at the summit. *Seeds* exceedingly minute, cuneate-obovoid.—DISTRIB. Species 3; Tenasserim coast, Mergui and Sumatra.

1. **A. Helferi,** *Hook. f.*; *Triana in Trans. Linn. Soc.* xxviii. 75; branches clothed with adpressed soft hairs, midrib of the leaves beneath with ascending subadpressed soft hairs, calyx-tube with ascending hairs. *Kurz For. Fl.* i. 507.

MERGUI; *Griffith, Helfer* (Kew Distrib. No. 2304).
Leaves 6 by 4 in.; petiole 2 in. Clusters of *flowers* ⅜ in. *Fruit* ⅛ in., ellipsoid.

2. **A. Griffithii,** *Hook. f.*; *Triana in Trans. Linn. Soc.* xxviii. 75; branches densely clothed with brown soft spreading and deflexed hairs, midrib of the leaves beneath densely clothed with similar patent hairs, calyx-tube with somewhat spreading hairs. *Kurz For. Fl.* i. 507.

MERGUI; *Griffith* (Kew Distrib. No. 2304).
Exactly as the preceding species except as to the small differences in the indumentum above stated. Probably will be found to be a variety only when more material is obtained.

10. **SONERILA,** *Roxb.*

Herbs, sometimes woody at the base, nearly always small, many stemless. *Leaves* opposite, equal or unequal, from round to linear, entire or serrulate, 3–5-nerved. *Flowers* in racemes or scorpioid spikes, mostly red. *Calyx-tube* campanulate or long-funnel-shaped; teeth 3, short. *Petals* 3, acute or obtuse. *Stamens* 3 (in *S. obliqua* 6), equal; anthers obtuse or attenuate at the top, cells at the base shortly divaricate; connective without appendage. *Ovary* inferior, 3-celled, glabrous at the apex; style simple, filiform; ovules many, placentas axile. *Capsule* obovoid, trigonous, elongate funnel-shaped, or campanulate, opening at the top by 3 valves. *Seeds* very many, smooth or covered by glandular points or small tubercles, ovoid or ellipsoid; raphe simple or running out into a lateral appendage, sometimes overtopping the seed.—DISTRIB. Species 58; 45 tropical Indian and Malayan, and 1 in South China.

SECTION A. Stamens 3. (To Species 42.)

* *Anthers short, truncate or acute at the top.*

† *Species not of Ceylon or the South Deccan Peninsula.*

1. **S. tenera,** *Royle Ill.* 215, t. 45; stem 2–4 in. erect little-divided, pedicels 0–$\frac{1}{8}$ in., anthers short oblong truncate hardly narrowed at the top. *Wall. Cat.* 4098 *partly.*

SUBTROPICAL WESTERN HIMALAYA, *Royle, Edgeworth.* CHOTA NAGPORE, alt. 1000–2000 ft., abundant; *C. B. Clarke.*

Stem weak, sometimes winged, puberulous or minutely pubescent. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ in., ovate, nearly entire, equal or unequal, with a few scattered lax hairs; petiole less than $\frac{1}{8}$ in. *Calyx-tube* puberulous and with a few scattered lax hairs; teeth (at time of flowering) ovate, acute, as long as broad. *Petals* $\frac{1}{8}$ in., ovate, acute, rose-purple. *Capsule* nearly $\frac{1}{4}$ in., trigonous, elongate funnel-shaped, ribs between the angles very obscure, often narrowed at the base so as to be subsessile. *Seeds* ovoid, smooth; raphe not excurrent.—Wallich has distributed with Royle's *S. tenera*, a Tavoy plant, *S. stricta*, and Royle has not detected the error. The pubescence of the stem as given in the figure of Royle is very unlike nature. Triana has named Royle's original specimen "potius *S. brachyandra,* Naud." a Manilla species, and has made Edgeworth's specimen and some Khasian ones of *S. stricta* the type of *S. tenera.*

2. **S. stricta,** *Hook. in Bot. Mag.* t. 4394; stem 3–7 in. erect often branched, pedicels in fruit often nearly $\frac{1}{4}$ in., anthers ovate much narrowed at the top.

KHASIA MTS., alt, 3000–4000 ft., plentiful. PEGU to TENASSERIM, frequent.

Stem more or less puberulo-pubescent, and also with long lax spreading hairs. *Leaves* $\frac{1}{4}$–1 in., lanceolate or elliptic, narrowed at each end, with scattered lax hairs. *Calyx-tube* puberulous and with a few scattered lax hairs, teeth broader than long. *Petals* $\frac{1}{8}$–$\frac{1}{4}$ in., obovate, rose-purple. *Capsule* $\frac{1}{4}$ in., trigonous, elongate funnel-shaped, ribs between the angles very obscure. *Seeds* ovoid, smooth; raphe not excurrent.—The type of this species is *S. burmannica Wall. Cat.* 4098, but the striking form *S. stricta* was first published and the name must therefore be maintained. The true *S. Rottleri* Wall. is a Courtallum species and widely different, but Wallich seems in hand-and-eye distribution to have mixed the present species with it.

VAR. *typica*; leaves with a few denticulations, uppermost sometimes in whorls of 4, often purplish beneath.—Moulmein; *Lobb* No. 347; *Parish,* No. 427.

VAR. *burmannica,* Wall. Cat. 4098; leaves usually entire or nearly so. S. tenera, *Wall. Cat.* 4098 *partly*; *Kurz in Journ. As. Soc.* 1877, pt. ii. 78. S. Rottleri, *Wall. Cat.* 4097 *partly.* Sonerila sp. 5 *Griff. Notul.* iv. 676.

3. **S. erecta,** *Jack in Mal. Misc. et in Hook. Bot. Misc.* ii. 63; stem 8–12 in. firm erect with opposite branches, racemes secund, flowers sessile, capsule long-cylindric subtrigonous, seeds hemi-ellipsoidal covered with glandular raised points, raphe shortly excurrent and overtopping the seed. *Wall. Cat.* 4092; *Benn. Pl. Jav. Rar.* p. 217; *Miq. Fl. Ind. Bat.* i. pt. i. 563; *Naud. in Ann. Sc. Nat. ser.* 3. xv. 324; *Triana in Trans. Linn. Soc.* xxviii. 75.

MOULMEIN, *Lobb.* PINANG, *Wallich.* MALAYA, *Maingay.*—DISTRIB. Malaya.

Stem bifariously hairy. *Leaves* $\frac{3}{4}$ in., equal or unequal, lanceolate, slightly ovate at the base, hairy on both surfaces, subentire or minutely denticulate, sessile and long-petioled on the same plant. *Racemes* 2–6-flowered. *Calyx-tube* minutely pubescent. *Petals* $\frac{1}{4}$ in., ovate, acute, rosy. *Anthers* ovate, much narrowed upwards. *Fruits* $\frac{3}{8}$–$\frac{1}{2}$ in., $\frac{1}{4}$ in. apart.

†† *Species of Ceylon and the South Deccan Peninsula.*

4. **S. zeylanica,** *W. & A. Prodr.* 322; branches quadrangular nearly glabrous, anthers $\frac{1}{10}$–$\frac{1}{8}$ in. ovate narrowed upwards, capsule $\frac{1}{4}$ in. funnel-shaped subtrigonous with 6 prominent ribs. *Arn. in Hook. Comp. Bot. Mag.* ii. 307 (Ceylanica); *Naud. in Ann. Sc. Nat. ser.* 3. xv. 321; *Thwaites Enum.* 109; *Triana in Trans. Linn. Soc.* xxviii. 75.

CEYLON, alt. 6000 ft.; *Thwaites, Walker.*

Stems 4–12 in. with many spreading branches. *Leaves* $\frac{3}{8}$–$\frac{3}{4}$ in., ovate or narrow-oblong, acute, denticulate, with a few scattered hairs above otherwise glabrous; petiole 0–$\frac{1}{2}$ in. *Calyx-tube* glabrous or with a few lax hairs. *Petals* $\frac{1}{4}$ in., purple or white, ovate, acute. *Capsule* about as long as its pedicel. *Seeds* with minute glandular elevated points, raphe excurrent but hardly overtopping the seed.—*S. zeylanica* is only separated from *S. rostrata* and *S. affinis* by the anthers, which (as above stated) are usually $\frac{1}{10}$–$\frac{1}{8}$ in. long in *S. zeylanica* while in *S. affinis* they are usually $\frac{1}{6}$ in. In those cases where the anthers of an authentic example of *S. zeylanica* are actually longer than those of some examples of *S. affinis,* we endeavour to fall back on the degree and nature of the attenuation of the anthers, which should be acute in *S. zeylanica,* acuminate in *S. affinis.* The var. *pumila* is more distinct from *S. zeylanica* than are *S. rostrata* and *S. affinis.* Triana has placed Thwaites' numbered specimens of these species under various others.

VAR. *pumila,* Thwaites Enum. 109 (sp.); anthers short-oblong very truncate.

VAR. *Walkeræ*; seed without elevated points, excurrent raphe very much overtopping the seed, being exactly over the top of the seed like a cap.—Perhaps a species. Ceylon; *Walker.*

5. **S. tomentella,** *Thwaites Enum.* 109; branches petioles and calyx-tube rusty-pubescent, anthers ovate very short, capsule short funnel-shaped trigonous 6-ribbed bristly. *Triana in Trans. Linn. Soc.* xxviii. 75.

CEYLON; Saffragam, *Thwaites.*

Branched, 10 in. high. *Leaves* ovate and ovate-oblong, minutely denticulate, with a few scattered hairs above, slightly pubescent beneath. *Petals* $\frac{1}{3}$ in., ovate, acute, white or pale rose. *Pedicels* as long as or longer than the capsule.

6. **S. Brunonis,** *W. & A. Prodr.* 321; stem a foot high somewhat stout branched nearly glabrous, leaves oblong-lanceolate longitudinally 5–7-nerved from near the base with very rarely one or two fainter nerves from the midrib higher up. *Wight Ill.* 94, *Ic.* t. 1059.

SOUTH DECCAN PENINSULA; Courtallum; *Wight* No. 1142. CEYLON, Newera Ellia; *Thwaites.*

Stems 4-angled. *Leaves* 1$\frac{1}{2}$–2$\frac{1}{2}$ in., with a few scattered hairs above and microscopic puberulous dots beneath; petiole $\frac{1}{2}$–1$\frac{1}{4}$ in. *Petals* $\frac{1}{3}$ in., mauve-purple, ovate acute. *Capsules* $\frac{3}{8}$ in., narrow-funnel-shaped, with six thick ribs, longer than the pedicels, clustered on the shortened racemes. *Seed* obovoid with glandular elevated points, raphe not excurrent.—The present species is exceedingly like *S. versicolor* or *S. axillaris,* but (as Wight observes) may always be recognised by the longitudinal nervation of the leaves.

7. **S. pedunculosa,** *Thwaites Enum.* 109; stem 3–10 in. weak rooting at the nodes, peduncles quasi-terminal very long, capsule $\frac{1}{8}$–$\frac{1}{4}$ in. funnel-shaped subtrigonous obscurely 6-ribbed usually shorter than the pedicel. *Triana in Trans. Linn. Soc.* xxviii. 75. S. Rottleri, *Wall. Cat.* 4097, *partly.*

TRAVANCORE, Quilon; *Wight* No. 1111. CEYLON; tropical; *Thwaites.*

Stems and peduncles glabrous or pubescent. *Leaves* 1–2$\frac{1}{2}$ in., ovate or oblong, minutely serrulate, sparsely pilose above minutely dotted beneath; petiole $\frac{1}{2}$–1$\frac{1}{2}$ in. *Peduncles* 2–6-flowered. *Calyx-tube* glabrous or with a few scattered hairs. *Petals* $\frac{1}{4}$ in., ovate, acute, reddish. *Seeds* with elevated points, raphe much excurrent on the side near the top.

8. **S. Arnottiana,** *Thwaites Enum.* p. 108; stem 12 in. high round branched upwards at least rufous-villous, petioles nerves of the leaves beneath

and peduncles with brown-red hairs, capsule $\frac{1}{5}$ in. broadly funnel-shaped trigonous 6-ribbed somewhat scabrous usually longer than the pedicel. *Bedd. Ic. Pl. Ind. Or.* t. 300.

CEYLON, alt. 6000 ft.; *Thwaites.*

Leaves nearly 2 by $\frac{3}{4}$ in., oblong or ovate, with 3–5 longitudinal nerves, nearly glabrous or with few scattered hairs above, minutely serrulate; petiole $\frac{1}{2}$–$\frac{3}{4}$ in. *Calyx-tube* with lax spreading hairs. *Petals* $\frac{1}{4}$–$\frac{1}{3}$ in., ovate, acute, purple. *Seeds* covered with elevated points, raphe excurrent the whole length of the seed.

VAR. *tenella*, Beddome in Trans. Linn. Soc. xxv. 217; stem leaves petioles and calyx-tube nearly glabrous.—Anamallays; alt. 3000 ft., *Beddome.* Stated by Col. Beddome to be allied to *S. Arnottiana*, Thwaites, and reduced to it by Triana in *Trans. Linn. Soc.* xxviii. 75. The examples communicated by Col. Beddome to Kew do not show fruit but seem the same as *S. Brunonis*; they differ considerably in their glabrousness from *S. Arnottiana.*

9. **S. Wightiana,** *Arn. in Hook. Comp. Bot. Mag.* ii. 307; stem attaining 15 in. round branched very brown-villous, petioles nerves of the leaves beneath and peduncles with brown or yellow hair, capsule $\frac{1}{4}$ in. funnel-shaped trigonous 6-ribbed scabrous usually shorter than the pedicel. *Triana in Trans. Linn. Soc.* xxviii. 75.

CEYLON; Adam's Peak; *Thwaites.*

Leaves $\frac{3}{4}$–$1\frac{1}{2}$ in., elliptic or oblong, with 3–5 longitudinal nerves, serrulate, with scattered scabrous hairs often on both surfaces; petiole often 1 in. *Calyx-tube* with lax spreading hairs. *Petals* $\frac{3}{8}$ in., purple, ovate, acute. *Anthers* ovate-oblong, obtuse. *Seeds* covered with elevated points, raphe scarcely excurrent.—This species only slightly differs from *S. Arnottiana* by its greater hairiness, its rather larger flowers, and more elongate capsule.

10. **S. Hookeriana,** *Arn. in Hook. Comp. Bot. Mag.* ii. 308; stem attaining 10 in. round branched and petioles and peduncles with red villous tomentum, leaves with scattered hairs on both surfaces, nerves beneath with spreading dense red or yellow hairs, capsule $\frac{1}{5}$ in. funnel-shaped trigonous 6-ribbed scarcely scabrous usually longer than the pedicel. *Naud. in Ann. Sc. Nat. ser.* 3. xv. 321; *Triana in Trans. Linn. Soc.* xxviii. 75.

CEYLON, Adam's Peak; *Walker, Thwaites* No. 173 and 426 *partly.*

Leaves $\frac{3}{4}$–$1\frac{1}{4}$ in., ovate or oblong, with 3–5 longitudinal nerves, serrulate; petiole $\frac{1}{4}$–$\frac{5}{8}$ in. *Calyx-tube* with many spreading rufous hairs. *Petals* $\frac{1}{3}$ in., ovate, acute (pale ?). *Anthers* ovate-oblong, obtuse. *Seeds* with subtubercular raised points, raphe much excurrent near the top of the seed.

11. **S. Gardneri,** *Thwaites Enum.* p. 107; stem 12 in. round rufous-villous, leaves ovate from a broad base short-petioled, petals $\frac{1}{2}$–$\frac{5}{8}$ in. broad-elliptic, capsule $\frac{1}{3}$ in. ovoid trigonous slightly scabrous and hispid usually longer than the pedicel. *Triana in Trans. Linn. Soc.* xxviii. 75; *Bedd. Ic. Pl. Ind. Or.* t. 298.

CEYLON, alt. 5000 ft.; Horton Plains, *Thwaites.*

Leaves $\frac{3}{4}$–1 in., minutely serrate with scattered hairs on both surfaces, nerves beneath rufous-villous; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Peduncles* short and with the *calyx-tube* rufous-villous. *Petals* mauve-purple. *Anthers* ovate-oblong, obtuse. *Seeds* subtuberculate with raised points, raphe elongated both above and below the seed.—This species is well separated from the preceding species by its ovoid not funnel-shaped capsule.

VAR. *firma, Triana l. c.*; leaves sessile. S. firma, *Thwaites ms.*—Ceylon, alt. 5000 ft., Central Province at Wattehelle; *Thwaites* No. 3873.—The example of this communicated by Mr. Thwaites to Kew is in flower and does not show fruit. It seems exactly *S. Gardneri* except as to the sessile leaves, but the fruit may prove it to be something quite different.

** *Anthers long attenuated or acuminated upwards.*

† *Plants with distinct stems, the leaves of each pair not very unequal.*

§ *Species of Ceylon and the South Deccan Peninsula.*

12. **S. robusta,** *Arn. in Hook. Comp. Bot. Mag.* ii. 308; stem attaining 21 in. shaggy with rufous-brown hair, leaves cordate-ovate sessile with long rufous hairs above and on the nerves beneath, capsule nearly $\frac{1}{4}$ in. campanulate trigonous hispid-scabrous 6-nerved, pedicel about $\frac{1}{4}$ in. *Naud. in Ann. Sc. Nat. ser.* 3. xv. 327; *Triana in Trans. Linn. Soc.* xxviii. 76.

CEYLON; *Walker*; Adam's Peak, alt., 5000–7000 ft. *Thwaites* No. 426 *partly*.

Branches ascending, round, with harsh or soft hairs. *Leaves* $\frac{1}{2}$ in., nearly entire. *Calyx-tube* with many spreading hairs. *Petals* $\frac{1}{2}$ in., elliptic, acute, purple. *Anthers* attenuated, long. *Capsules* 3–6 to the raceme, nearly sessile. *Seeds* with raised points, raphe excurrent on one side near the top.

VAR. *glabricaulis,* Thwaites ms.; stem 4-angular nearly glabrous, leaves sessile nearly glabrous beneath.—Ceylon; at Boputalanda, Central Provinces, *Thwaites* No. 3955.

13. **S. Harveyi,** *Thwaites Enum.* 107; stem 18 in. erect with ascending quadrangular branches nearly glabrous, calyx-tube glabrous, anthers subacuminate but much shorter and less attenuate than in *S. robusta.*

CEYLON, Central Province, alt. 6000–7000 ft.; *Thwaites* No. 2974.

Leaves $\frac{5}{8}$ in., rhomboid-oblong, unequal-sided, obtuse or subcordate at the base, glabrous on both surfaces, denticulate; petiole about $\frac{1}{20}$ in. *Racemes* short. *Petals* $\frac{1}{3}$ in., elliptic, acute, purple.—Triana *in Trans. Linn. Soc.* xxviii. 76 has erroneously called this species *S. Hartwegi,* and altered the naming of Thwaites' examples so as to confuse it with No. 12 *S. robusta.*

14. **S. affinis,** *Arn. in Hook. Comp. Bot. Mag.* ii. 307; stem 4–12 in. branching nearly glabrous, leaves ovate and ovate-lanceolate serrate, capsule $\frac{1}{8}$–$\frac{1}{3}$ in. funnel-shaped trigonous 6-ribbed smooth usually shorter than the pedicel. *Naud. in Ann. Sc. Nat. ser.* 3. xv. 325; *Thwaites Enum.* 109; *Triana in Trans. Linn. Soc.* xxviii. 76.

CEYLON, Central Province, alt. 4000 ft.; *Thwaites*; *Gardner, Walker.*

Leaves $\frac{7}{8}$ in. (sometimes much smaller), thin, sparsely pilose above, minutely glandular-dotted and sometimes thinly hairy beneath; petiole $\frac{3}{8}$ in. *Calyx-tube* nearly glabrous, or with a few lax hairs. *Petals* $\frac{1}{3}$ in., ovate, acute, mauve. *Anthers* oblong, attenuated upwards. *Seed* with raised points, raphe excurrent on one side near the top.—See the remarks under No. 4 *S. zeylanica.*

VAR. *rostrata,* Thwaites Enum. 108 (sp.); anthers more attenuated, leaves less serrated, flowers usually a deeper colour.—Ceylon, alt. 1000–2000 ft.; *Thwaites* No. 2644.

15. **S. rhombifolia,** *Thwaites Enum.* 108; glabrous, stem 1–2 ft., leaves rhomboid narrowed at both ends crenate-serrate, capsule $\frac{1}{5}$ in. funnel-shaped trigonous 6-ribbed about as long as the pedicel.

CEYLON; at no great elevation, *Thwaites.*

Leaves 1 in., 3-nerved the lateral nerves near the margin, minutely glandular-punctate; petiole $\frac{1}{3}$ in. *Petals* $\frac{1}{3}$ in., purple-mauve. *Seeds* with raised points, raphe excurrent on one side near the top.

16. **S. amabilis,** *Triana in Trans. Linn. Soc.* xxviii. 76; branches woody round with scattered ascending bristly hairs, leaves oblong petioled 3-nerved subentire with scattered bristly hairs on both surfaces, capsule $\frac{1}{3}$ in. funnel-shaped or somewhat campanulate trigonous 6-ribbed smooth.

SOUTHERN DECCAN PENINSULA, Tinnivelly, alt. 2000 ft.; *Col. Beddome.*

Leaves 1½ in., narrowed to each end, obtuse; petiole ½ in. *Racemes* 3–6-flowered, crowded. *Calyx-tube* with few lax hairs. *Petals* ⅜–½ in., mauve. *Anthers* long, much attenuate.—Mr. Kurz had published a very different species as *Sonerila amabilis*, namely, *S. Kurzii* (No. 38).

17. **S. travancorica,** *Bedd. Ic. Pl. Ind. Or.* t. 156; branches stout round adpressedly villous, leaves elliptic acute subentire pinnate-nerved with many long brown hairs on both surfaces, capsule ⅓ in. subcampanulate trigonous 6-ribbed smooth longer than the pedicel. *Triana in Trans. Linn. Soc.* xxviii. 76.

TRAVANCORE, alt. 4000 ft.; *Col. Beddome.*

Leaves 1½–3 in., acute but scarcely acuminate, glandular-dotted, shaggy on the nerves beneath; petiole ¼–1½ in. *Racemes* 3–9-flowered, short, pedicels with few scattered hairs. *Calyx-tube* glabrous or sparsely pilose. *Petals* ⅜–½ in., mauve, elliptic, acute. *Anthers* oblong, much attenuated upwards. *Seed* with raised points, raphe excurrent on one side near the top.

18. **S. hirsutula,** *Arn. in Hook. Comp. Bot. Mag.* ii. 307; branches with spreading rufous hairs, leaves ovate or oblong subentire with many long brown hairs on both surfaces glandular-dotted and shaggy on the nerves beneath, calyx-tube with many lax patent rufous brown hairs. *Thwaites Enum.* p. 108; *Triana in Trans. Linn. Soc.* xxviii. 76.

CEYLON, Central Province, alt. 6000–7000 ft.; *Walker, Thwaites* No. 276.

Stem 1–2 ft. high, erect; branches round with four lines. *Leaves* 1–3 in., 5-nerved from near the rounded or cordate base or imperfectly pinnate-nerved; petiole often 2 in. *Racemes* short-peduncled, about 4-flowered. *Petals* ⅝ in., elliptic, acute, mauve. *Anthers* greatly elongate. *Capsule* ¼–⅓ in., subcampanulate, strongly 6-ribbed, longer than the pedicel.—This species is very near *S. travancorica*; it differs by the patent (not adpressed) hairs on the stem, and the broad or cordate (not acute) base of the leaves.

19. **S. pilosula,** *Thwaites Enum.* p. 108; leaves ovate-lanceolate pinnate-nerved with short hairs over both surfaces very unequal at the base, calyx-tube with many short patent hairs, petals ⅜ in. purple-red. *Triana in Trans. Linn. Soc.* xxviii. 76.

CEYLON, *Walker*; Saffragam District, alt. 1000–2000 ft., *Thwaites.*

Stem 6–18 in., round, striated, with many short patent hairs. *Leaves* 2–3½ in., entire, somewhat acuminate; petiole 1–2¼ in. *Racemes* short, 6–12-flowered. *Anthers* much elongate. *Capsule* funnel-shaped, 6-ribbed (Thwaites).—This species is marked by the very unequal base of the leaves; one side of the blade being often continued for ¼ in. along the petiole. Perhaps a form of No. 22 *S. elegans.*

20. **S. speciosa,** *Zenk. Pl. Ind.* 18, t. 18; stem nearly or quite glabrous below ending in a long peduncle villous upwards, leaves 5–9-nerved from the base, petals ⅝ in. mauve round-elliptic acute, capsule ⅜ in. hispid oblong trigonous from a subcampanulate base. *Zenk. in Ann. Sc. Nat. ser.* 1. vi. 151; *Bot. Mag.* t. 5026; *Wight Ic.* t. 995–2; *Triana in Trans. Linn. Soc.* xxviii. 76. S. solanoides, *Naud. in Ann. Sc. Nat. ser.* 3. xv. 324, xvi. t. 18, f. 3. S. orbiculata, *Lindl. in Journ. Hort. Soc.* viii. 57, *with fig.* S. elegans, *Bot. Mag.* 4978, *not of Wight.*

Hills of the South DECCAN PENINSULA, frequent: NILGHIRIS, *Wight*; MYSORE, *T. Lobb*; COURTALLAM, *Wight*; &c.

Stems attaining 9–12 in., upper half often naked. *Leaves* 2–3 in., ovate or elliptic,

acute, glabrous or nearly so, denticulate or subserrate; petiole 1–2 in. *Raceme* often subpaniculate with 8–14 flowers and very hirsute. *Calyx-tube* generally with much lax brown hair. *Anthers* shortly beaked. *Capsule* definitely but lightly 6-ribbed, erect, usually longer than its pedicel. *Seeds* with raised points; raphe large, excurrent, like a hood near the top of the seed on one side.

21. **S. grandiflora,** *Wall. Cat.* 4099; stems very woody below branching round, leaves glabrous bristle-serrate 5–7-nerved from the base, petals $\frac{5}{8}$–$\frac{3}{4}$ in. elliptic acute mauve. *Wight. Ic.* t. 995; *W. & A. Prodr.* 322; *Bot. Mag.* t. 5354; *Benn. Pl. Jav. Rar.* 216; *Triana in Trans. Linn. Soc.* xxviii. 76.

NILGHIRIS; near Sisparah, *Wight, Gardner.*
Leaves 1–2 in., crowded on the branchlets, oblong or elliptic, narrowed at both ends, acute, not much acuminate; petiole $\frac{1}{4}$–$\frac{3}{4}$ in. *Racemes* densely flowered; peduncles short, terminal. *Calyx-tube* glabrous. *Anthers* much attenuated. *Capsule* $\frac{1}{4}$–$\frac{1}{3}$ in., funnel-shaped, smooth, obscurely ribbed.

22. **S. elegans,** *Wight Ic.* t. 995–3; leaves pinnate-nerved with a very few scattered hairs above nearly or quite glabrous beneath, raceme pubescent, pedicel and calyx-tube hairy, capsule finally with its pedicel stiffly scabrous.

NILGHIRIS, Sispara; *Wight* No. 1109 *partly, McIvor.*
Suffrutescent; branches glabrous or with few scattered hairs. *Leaves* 2–4 in., elliptic-lanceolate from a rounded base, minutely serrulate, sometimes purpurascent beneath; petiole $\frac{1}{2}$–2 in. *Racemes* lateral and terminal, long-peduncled. *Petals* $\frac{1}{2}$ in., light mauve. *Capsule* $\frac{3}{8}$ in., erect, funnel-shaped, trigonous, rather obscurely 6-ribbed, longer than its pedicel. *Seeds* with prominent raised points, raphe much excurrent near the top on one side.—This has been confused with the next species by Triana (*Trans. Linn. Soc.* xxviii. 76) and in Herbaria. It decisively differs by the very scabrous ripe capsules: also the indumentum of the leaves is different, and the peduncle longer. *S. pilosula* Thwaites (No. 19) may be a form of this with more pubescent leaves.

23. **S. versicolor,** *Wight Ic.* t. 1057; leaves pinnate-nerved with scattered hairs on both surfaces, raceme nearly glabrous, pedicel and calyx-tube glabrous, capsule finally quite glabrous. S. axillaris, *Wight. Ic.* t. 1058.

NILGHIRIS; *Wight*; *Gardner*, &c. MYSORE, *T. Lobb.*
Suffrutescent, branches pubescent. *Leaves* 2–4 in., elliptic-lanceolate from a rounded base, finely serrulate, sometimes purpurascent beneath, hairs above sometimes with vesicular bases (giving the leaves a spotted appearance); petiole 1–3 in. *Racemes* terminal and many lateral. *Petals* $\frac{1}{2}$ in., mauve. *Capsules* $\frac{3}{8}$–$\frac{1}{2}$ in., erect, in crowded clusters, narrowly funnel-shaped or almost oblong, rather obscurely 6-ribbed, longer than the pedicel. *Seeds* with prominent raised points, raphe excurrent near the top on one side.—*S. axillaris* Wight is exactly the same plant the axillary racemes being placed alternately up the stem on short peduncles with some regularity. *S. pilosula* (No. 19) differs by its hairy racemes and calyx-tube. In both *S. versicolor* and *S. elegans* the leaves are more or less unequal at the base.

24. **S. lanceolata,** *Thwaites Enum.* p. 107; leaves sessile long-lanceolate from a rounded base glabrous, capsules $\frac{1}{4}$–$\frac{1}{3}$ in. clustered glabrous oblong somewhat funnel-shaped distinctly 6-ribbed longer than the pedicel. *Triana in Trans. Linn. Soc.* xxviii. 76; *Bedd. Ic. Pl. Ind. Or.* t. 299.

CEYLON, alt. 1000 ft., *Walker, Thwaites.*
Suffrutescent; branches round, glabrous. *Leaves* 2–3 in., 3-nerved from the base distantly serrulate upwards; petiole less than $\frac{1}{12}$ in. *Petals* $\frac{1}{3}$ in., mauve, broad elliptic, acute. *Anthers* not much attenuated. *Seeds* smooth or nearly so; raph large, hooded, excurrent the whole length of the seed.

25. **S. angustata,** *Triana in Trans. Linn. Soc.* xxviii. 76; glabrous, leaves narrowly lanceolate 1-nerved, capsule $\frac{1}{5}$ in. short funnel-shaped cernuous about equal in length to the pedicel. S. rhombifolia β. angustata, *Thwaites ms.*

CEYLON; District Galle, *Thwaites* No. 2799 partly.

Stem 6 in.; branches wiry, subquadrangular. *Leaves* $1\frac{3}{4}$ by $\frac{1}{4}$ in., with remote shallow crenatures upwards; petiole $\frac{1}{5}$ in.—The species is distinguished from No. 15 *S. rhombifolia* Thwaites by Triana, and the leaves appear very different. The specimen of Thwaites has no flowers.

§§ *Species of the Transgangetic Peninsula.*

26. **S. tenuifolia,** *Blume in Flora*, 1831, 491; stem attaining a foot glabrous or with a few spreading hairs, leaves ovate-lanceolate acuminate strongly serrate, capsule glabrous with a very wide mouth. *Benn. Pl. Jav. Rar.* 211, t. 44; *Naud. in Ann. Sc. Nat. ser.* 3. xv. 324; *Miq. Fl. Ind. Bat.* i. pt. i. 563; *Triana in Trans. Linn. Soc.* xxviii. 76.

MALACCA, Mount Ophir; *T. Lobb, Maingay* No. 779.—DISTRIB. Java.

Leaves $\frac{3}{4}$–2 in., unequal, often pilose above; petiole $\frac{1}{2}$–$1\frac{1}{2}$ in. *Anthers* oblong, attenuated. *Capsule* $\frac{1}{5}$–$\frac{1}{4}$ in., trigonous, shorter than its pedicel, mouth $\frac{1}{4}$–$\frac{1}{3}$ in. broad. *Seeds* with raised points, raphe excurrent on one side near the top.

27. **S. linearis,** *Hook. f. ms.*; *Triana in Trans. Linn. Soc.* xxviii. 76; nearly glabrous, leaves linear-spathulate sessile minutely distantly toothed or subentire, capsule $\frac{1}{4}$ in. campanulate narrow-cylindric glabrous faintly 6-ribbed longer than the pedicel. *Kurz in Journ. As. Soc.* 1877, pt. ii. 78.

MOULMEIN, on Mount Gerai, alt. 3000 ft., *T. Lobb* No. 345, 425.

Very erect, 15 in., with small round branches. *Leaves* 1 by $\frac{1}{16}$ in. *Racemes* terminal, 2–4-flowered. *Calyx-tube* minutely puberulous. *Petals* $\frac{1}{4}$ in., mauve. *Anthers* slender, attenuated upwards.

28. **S. picta,** *Korth. Verh. Nat. Gesch. Bot.* 249, t. 52; leaves ovate or lanceolate pinnate-nerved serrulate, racemes about 6-flowered short-peduncled terminal, calyx-tube and pedicel puberulous subpubescent, petals $\frac{1}{2}$ in. elliptic acute mauve, anthers much elongate. *Blume Mus. Bot.* i. 11; *Miq. Fl. Ind. Bat.* i. pt. i. 564; *Naud. in Ann. Sc. Nat. ser.* 3. xv. 326; *Triana in Trans. Linn. Soc.* xxviii. 76; *Kurz in Journ. As. Soc.* 1877, pt. ii. 78.

MERGUI, *Griffith*; Moulmein, *T. Lobb, Parish.*—DISTRIB. Sumatra.

Stem 4–8 in., little divided, pubescent or subtomentose upwards. *Leaves* 1–4 in., nearly glabrous, pubescent on the nerves beneath, usually none of the nerve quite basal and 2–3 nerves high up the midrib, blotched white or not along the midrib above; petiole $\frac{1}{8}$–$\frac{3}{8}$ in. *Capsule* (ex Korthals) funnel-shaped, trigonous, sparsely pilose. *Seeds* with raised points, raphe very excurrent, hooded.

VAR. *Lobbii*; stem very rusty tomentose, leaves small scarcely 1 in.—Top of Thoungyeen, Moulmein, alt. 4000 ft.; *T. Lobb.*

29. **S. secunda,** *R. Br. in Wall. Cat.* 4094; stem weak pubescent simple, leaves elliptic acute pinnate-nerved, peduncle capsules and pedicels glabrous, capsule $\frac{1}{5}$ in. funnel-shaped subtrigonous as long as the pedicel, ribs not prominent. *Benn. Pl. Jav. Rar.* 216; *Triana in Trans. Linn. Soc.* xxviii. 76; *Kurz in Journ. As. Soc.* 1877, pt. ii. 78.

TAVOY; *Wallich.*

Stem 2–4 in., with 4–5 large leaves approximated at its summit. *Leaves* 2–$4\frac{1}{2}$ in., minutely denticulate, with scattered long lax hairs on both surfaces, hairs some-

times vesicular at the base, sometimes blotched along the midrib above; petiole $\frac{1}{4}$-$\frac{1}{2}$ in. *Peduncle* terminal, 2-3 in. *Flowers* not seen.

§§§ *Species of Bengal.*

30. **S. squarrosa,** *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* i. 182; stem 2–4 in. little divided thick, leaves crowded towards the upper part of the stem spathulate-lanceolate serrulate, petiole jointed on a tubercle of the stem which is supported on each side by rufous bristles, flowers racemed. *Wall. Cat.* 4093, *Pl. As. Rar.* t. 102; *Naud. in Ann. Sc. Nat. ser.* 3. xv. 325; *Triana in Trans. Linn. Soc.* xxviii. 76.

KHASIA MTS., alt. 3000–4000 ft.; frequent.

Leaves $\frac{3}{4}$–$1\frac{1}{2}$ in., glabrous, attenuated into the petiole; stipules $\frac{1}{8}$–$\frac{1}{4}$ in. *Racemes* few-flowered; peduncles subterminal, short. *Calyx-tube* glabrous. *Petals* $\frac{1}{4}$–$\frac{1}{3}$ in., ovate, acute, mauve. *Capsule* $\frac{1}{4}$ in., glabrous, funnel-shaped, subtrigonous, hardly ribbed, pedicel very short. *Seed* obovoid, without raised points, raphe not at all excurrent.

31. **S. arguta,** *R. Br. in Wall. Cat.* 4095; stems 0–2 in., leaves elongate spathulate, petiole jointed on a tubercle of the stem which is supported on each side by a rufous bristle, peduncle 1-flowered. *Naud. in Ann. Sc. Nat. ser.* 3. xv. 326; *Triana in Trans. Linn. Soc.* xxviii. 76.

KHASIA MTS., alt. 3000–4000 ft., *Wallich, H. f. & T., C. B. Clarke.*

Leaves (including the petiole) 1–4 by $\frac{1}{4}$–$\frac{1}{3}$ in., attenuated into the petiole, with scattered large hairs above or glabrous, 1-nerved, very minutely denticulate. *Peduncle* $1\frac{1}{2}$–2 in. *Calyx-tube* glabrous. *Petals* $\frac{3}{8}$–$\frac{1}{2}$ in., mauve, elliptic, acute. *Capsule* $\frac{3}{8}$ in., oblong, glabrous, subtrigonous, ribs obscure. *Seed* obovoid, with minute raised points, raphe not excurrent.—One example collected by Sir J. D. Hooker has broadly lanceolate leaves, $\frac{3}{8}$ in. broad, but agrees otherwise with the type.

32. **S. maculata,** *Roxb. Fl. Ind.* i. 177; stem short decumbent round often divided and with several lateral racemes, leaves pinnate-nerved ovate or lanceolate from a rounded or narrowed base ciliate scarcely serrulate usually with many long hairs on both surfaces sometimes nearly glabrous, peduncles not very long, capsules glabrous cernuous in clusters of 5–15. *Wall. Cat.* 4091; *Triana in Trans. Linn. Soc.* xxviii. 76; *Kurz in Journ. As. Soc.* 1877, pt. ii. 78. S. emaculata, *Roxb. Fl. Ind.* i. 178. S. angustifolia, *Roxb. l. c., not of Wall. Cat.*; *Wall. Pl. As. Rar.* t. 102. S. picta, *Griff. Notul.* iv. 676 (*ex Kurz in Flora* 1871–90). S. Brandisiana, *Kurz in Flora,* 1871, 290. Sonerila sp. 3 and 4, *Griff. Notul.* iv. 676.

NIPAL; *Wallich.* ASSAM HILLS and KHASIA MTS., alt. 1000–5000 ft., plentiful. MARTABAN and TENASSERIM, *Kurz.*

Leaves often 4 by 2 in., frequently unequal at the base, sometimes appearing spotted above from vesicular-based hairs; petiole 1–2 in., usually ciliate and pubescent. *Calyx-tube* puberulous, and generally with a few scattered hairs. *Petals* mauve, elliptic, very acute. *Capsule* $\frac{1}{4}$ in., oblong or somewhat funnel-shaped, slightly trigonous, obscurely ribbed, much longer than the pedicel. *Seeds* with prominent raised points, raphe only slightly excurrent near the top of the seeds on one side.—*Wall. Cat.* 4090 marked *Sonerila angustifolia Roxb.* is an *Argostemma.*

†† *Plants with distinct stems, the leaves of each pair exceedingly dissimilar.*

33. **S. moluccana,** *Roxb. Fl. Ind.* i. 178; stem short hirsute, larger leaf of each pair 4–5 in. with a petiole of 1 in. the smaller one $\frac{1}{2}$ in., capsule

intensely hispid scabrous. *Wall. Cat.* 4089; *Blume Mus. Bot.* i. p. 10; *Benn. Pl. Jav. Rar.* 215; *Miq. Fl. Ind. Bat.* i. pt. i. 562; *Triana in Trans. Linn. Soc.* xxviii. 77. S. paradoxa, *Naud. in Ann. Sc. Nat. ser.* 3. xv. 321. S. begoniæfolia, *Blume Mus. Bot.* i. p. 11; *Naud. l. c.* 322; *Triana l. c.*

PINANG; *Wallich, Griffith, Maingay.* MALACCA; *Maingay.* SINGAPORE; *Wallich, Lobb.*—DISTRIB. Malaya.

Leaves ovate-lanceolate, very unequal at the base, pinnate-nerved, with much rufous or brown hair on both surfaces, ciliate, hardly serrulate. *Calyx-tube* very shaggy. *Petals* $\frac{1}{3}$ in., elliptic, acute. *Capsule* less than $\frac{1}{5}$ in., broad-campanulate, longer than its pedicel. *Seeds* almost epunctate, raphe very strongly excurrent near the top on one side.

††† *Stemless or almost stemless species (the stem sometimes elongate in* S. Griffithii).

§ *Capsule subhemispheric, i.e. short with the three angles obscure.*

34. **S. Wallichii,** *Benn. Pl. Jav. Rar.* 215; leaves pinnate-nerved ovate acute, capsule short subcampanulate glabrous crowned by a prominent white margin, seeds with raised points and the raphe moderately excurrent on one side towards its top. *Triana in Trans. Linn. Soc.* xxviii. 77. S. Rheedii, *Wall. Cat.* 4096; *W. & A. Prodr.* 321. S. acaulis, *Beddome in Trans. Linn. Soc.* xxv. 216.

South MALABAR GHATS. COCHIN, *Johnston*; ANAMALLAYS, *Beddome*; BABABOODUN HILLS, *Law.*

Leaves from $\frac{1}{2}$ to 5 in. often broad or cordate at the base sometimes acute, minutely denticulate or entire, usually puberulous and also with a few scattered hairs; petiole 0–2$\frac{1}{2}$ in. *Peduncle* 1–8 in.; flowers 3–17, crowded, subumbelled; pedicels glabrous. *Petals* $\frac{1}{4}$ in., elliptic, acute, mauve. *Anthers* not greatly elongate. *Capsule* $\frac{1}{16}$–$\frac{1}{10}$ in. exclusive of the margin, shorter than the pedicel.

35. **S. scapigera,** *Dalz. in Hook. Lond. Journ. Bot.* vii. 672, t. 23; leaves nerved from near the base ovate or ovate-oblong, capsule campanulate glabrous crowned by a very narrow margin, seeds without raised points or excurrent raphe. *Dalz. & Gibs. Bomb. Fl.* 93; *Triana in Trans. Linn. Soc.* xxviii. 77.

BOMBAY GHATS, *Dalzell*; CONCAN and Bababoodun Hills, *Law*; MYSORE, *Lobb.*

Leaves commonly $\frac{1}{2}$–1$\frac{1}{2}$ in., broad or cordate at the base, minutely crenate-serrate, glabrous, sometimes glandular puberulous dotted above; petiole often 2 in. *Peduncle* 1–3 in.; flowers 4–10, crowded, subumbellate; pedicels glabrous or nearly so. *Petals* $\frac{1}{3}$–$\frac{3}{8}$ in., elliptic, acute, mauve. *Anthers* much elongate. *Capsule* $\frac{1}{8}$–$\frac{1}{6}$ in., shorter than the pedicel.—The peduncle pedicels and petioles frequently become succulent and much thickened. Generally resembling *S. Wallichii* and closely allied to it.

36. **S. rotundifolia,** *Bedd. in Trans. Linn. Soc.* xxv. 216; leaves orbicular or ovate nerved from near the base, peduncles 1–4-flowered, raceme glabrous or nearly so, capsule short hemispheric glabrous crowned by a narrow margin, seeds with raised large subtubercular points raphe not excurrent. *Triana in Trans. Linn. Soc.* xxviii. 77; *Bedd. Ic. Pl. Ind. Or.* t. 169.

SOUTH DECCAN; Anamallays, alt. 5000 ft.; *Beddome.*

Leaves $\frac{1}{2}$–$\frac{3}{4}$ in. diam., cordate at the base, minutely denticulate, glabrous and minutely puberulous, dotted on both surfaces; petiole $\frac{1}{2}$–1$\frac{1}{2}$ in. *Peduncles* 1$\frac{1}{2}$–3 in. *Petals* $\frac{3}{8}$ in., orbicular-obovate, mauve. *Anthers* short for the genus, little attenuate, truncate. *Capsule* $\frac{1}{16}$–$\frac{1}{10}$ in., shorter than the pedicel.

37. **S. Kurzii,** *C. B. Clarke*; leaves orbicular nerved from the base, pedicels 3–5 with many patent hairs, capsule short (*Kurz*). S. amabilis, *Kurz in Flora,* 1871, 290.

SIKKIM; Rungait Valley, alt. 4000–5000 ft., *Kurz*; Rungbee Valley, alt. 2000–3000 ft., *Jaffrey.*

Leaves $\frac{1}{2}$–$\frac{3}{4}$ in. diam., with many long patent hairs, subentire, cordate at the base; petiole $\frac{1}{2}$–$1\frac{1}{4}$ in., with long patent hairs. *Peduncle* 1–2 in., with many patent hairs; pedicels crowded, subumbelled. *Petals* $\frac{3}{8}$ in., broadly elliptic, obtuse, rose-mauve. *Anthers* narrower upwards, hardly acuminated.

§§ *Capsule oblong funnel-shaped, distinctly trigonous.*

38. **S. Griffithii,** *C. B. Clarke*; leaves glabrous minutely dotted puberulous beneath, capsule $\frac{1}{5}$ in. funnel-shaped, pedicel nearly $\frac{1}{5}$ in., seeds with very minute points raphe prominently excurrent on one side near the top.

MALACCA, Mount Ophir; *Griffith* (Kew Distrib. No. 2300), *T. Lobb, Maingay* No. 781.

Stemless, or the stem 1–$2\frac{1}{2}$ in. *Leaves* $\frac{1}{2}$–1 in., ovate, glabrous or with scattered bristly hairs above, minutely denticulate, subciliate, nerves from near the base; petiole $\frac{1}{4}$–1 in. *Peduncle* 1–4 in., 2–6-flowered; raceme short, glabrous or nearly so. *Petals* $\frac{1}{3}$ in., broadly elliptic, acute. *Anthers* long, attenuate.

39. **S. nudiscapa,** *Kurz in Journ. As. Soc.* 1877, pt. ii. 78; leaves with flaccid scattered hairs beneath, capsule $\frac{1}{5}$ in. narrow funnel-shaped, pedicel much shorter, seeds with very small minute raised points raphe scarcely excurrent.

MERGUI; *Griffith* (Kew Distrib. No. 2303). TENASSERIM OR ANDAMANS, *Helfer* (Kew Distrib. No. 2303).

Nearly stemless. *Leaves* 1–2 in., very thin, ovate or elliptic-oblong, obtuse, nearly entire, somewhat pinnate-nerved; petiole 0–$\frac{3}{4}$ in. *Peduncle* 1–$1\frac{1}{2}$ in., 3–8-flowered; raceme short, glabrous or nearly so. *Petals* $\frac{1}{4}$ in., elliptic, acute. *Seeds* hardly half as large as in any other species.

40. **S. violæfolia,** *Hook. f. ms.*; *Triana in Trans. Linn. Soc.* xxviii. 77; glabrous, bundles of rufous bristles $\frac{1}{8}$–$\frac{1}{5}$ in. about the base of the petioles, capsule $\frac{1}{5}$ in. funnel-shaped usually shorter than the pedicel, seeds with minute raised points raphe not excurrent. *Kurz in Journ. As. Soc.* 1877, pt. ii. 78.

MOULMEIN; *Lobb* No. 356.

Stemless. *Leaves* 1–2 in., ovate, entire or minutely denticulate, 5-nerved, the upper two nerves often branching from the midrib at a point some way above its base; petiole $\frac{1}{2}$–$2\frac{1}{4}$ in. *Peduncle* 1–$3\frac{1}{4}$ in., 3–8-flowered. *Petals* $\frac{1}{3}$ in., mauve, elliptic, acute. —In this and the next species the rufous bristles at the base of the petiole are exceedingly like those in *S. arguta* and *S. squarrosa*, but they are in numerous tufts (not 2 only and quasi-stipular as in those species) and the petiole is not jointed on a tubercle of a woody stem as in those species.

41. **S. khasiana,** *C. B. Clarke*; bundles of rufous bristles $\frac{1}{8}$–$\frac{1}{4}$ in. about the base of the petioles, leaves usually with scattered bristly hairs above, capsule $\frac{1}{8}$–$\frac{1}{5}$ in. oblong shorter than the pedicel, seeds with minute dots raphe not excurrent.

KHASIA MTS., alt. 4000–5000 ft.; Mamloo, Kalapani, *H. f. & T.*; Jarain in Jaintea, *C. B. Clarke.*

Stemless. *Leaves* less than 1 in., ovate, often acute, entire, ciliate but scarcely serrate, 5-nerved from the base or the two upper nerves from the midrib; petiole ½–1½ in. *Peduncle* 1–2½ in., 1–4-flowered. *Petals* ⅓ in., mauve, elliptic, acute. *Anthers* long, narrowed upwards but scarcely acuminate.—Near *S. violæfolia*, and possibly a hairy dwarf mountain form of it.

SECTION B. Stamens 6.

42. **S. heterostemon,** *Naud. in Ann. Sc. Nat. ser.* 3. xv. 326, xvi. t. 18, f. 4; glabrous or nearly so, leaves unequal, stamens 3 with longer filaments and purple anthers somewhat produced at base 3 with yellow anthers not produced, capsule broadly funnel-shaped sessile.

MALACCA; *Griffith, Lobb, Cuming.* SINGAPORE; *Maingay.*—DISTRIB. Malaya.

Stems attaining 18 in., much branched, with many lateral racemes. *Leaves* 2–4½ in., elliptic, acuminate or acute, broad often unequal at the base, entire, with 5–7 main longitudinal nerves; petiole ¼–1½ in. *Racemes* on short peduncles, elongate in fruit, 10–20-flowered. *Seeds* with raised points, raphe excurrent the whole length of the seed.—The sessile broad funnel-shaped capsules readily distinguish this species. The leaves are sometimes puberulous subpubescent on the nerves, and sometimes show spots on the upper surface. This species is reduced to *S. obliqua, Korth. Verh. Nat. Gesch. Bot.* p. 250 by Triana and probably correctly: but *S. obliqua Korth.* is classed as triandrous by all who quote it: cf. *Miq. Fl. Ind. Bat.* i. pt. i. 563.

43. **S. Bensoni,** *Hook. f. in. Bot. Mag.* t. 6049; glabrous below, peduncle upwards and raceme hairy, stamens equal, anthers all yellow not produced at the base.

Raised in London from seed sent from the MALABAR GHATS by Col. Benson.

This plant seems exactly *S. speciosa* (No. 20). The change of habitat and forcing in rich soil in an English stove may have developed the three stamens usually suppressed in the genus (?).

DOUBTFUL SPECIES.

S. BULLATA, *Griff. Notul.* iv. 675, from Malacca, is not identifiable. Triana (Trans. Linn. Soc. xxviii. 77) thinks it may be a *Driessenia*, but the terminal panicle points rather to *Allomorphia.*

S. GLABERRIMA, *Arn. in Hook. Bot. Mag.* ii. 307. The specimen thus named in Wight's Herbarium is *S. rhombifolia.* We have seen no other.

S. HELFERI, *C. B. Clarke*; stem 8 in. branched woody round rusty-pubescent, leaves ⅝ in. elliptic acute entire 3-nerved from the base rusty shortly pubescent on both surfaces as is the petiole (¼ in.), racemes lateral 2–4-flowered on peduncles less than ¼ in., capsule ¼–⅓ in. funnel-shaped subsessile nearly glabrous with triangular erect teeth.—TENASSERIM or ANDAMANS, *Helfer* (Kew Distrib. No. 2295).

S. MACULATA; Rheede's plant (Hort. Mal. ix. t. 65) usually referred to *S. maculata* is certainly not that plant; it may be No. 20 *S. speciosa*, Zenk.

11. SARCOPYRAMIS, *Wall.*

An erect glabrous herb; stem quadrangular. *Leaves* petioled, ovate or lanceolate, serrulate, 3-nerved. *Flowers* in small clusters, pedicelled or nearly sessile, axillary and terminal, small, rose-purple. *Calyx-tube* glabrous, obpyramidal, 4-winged; limb very short, 4-toothed. *Petals* 4, ovate. *Stamens* 8, equal; anthers oblong, scarcely produced at the base, connective appendaged at the base with a spur. *Ovary* half-adnate to the calyx, 4-celled; style filiform; ovules very many, placentas axile. *Capsule* crowned with four large scales,

opening by 4 valves at the top. *Seeds* numerous, obovoid, covered with prominent raised points, raphe not excurrent.

1. **S. nepalensis,** *Wall. Tent. Fl. Nep.* t. 23; *Cat.* 4088; *Benn. Pl. Jav. Rar.* 214. S. lanceolata, *Wall. Cat.* 6290; *Benn. l. c.*; *Kurz in Journ. As. Soc.* 1877, pt. ii. 77. S. grandiflora, *Griff. Notul.* iv. 678; *Ic. Pl. Asiat.* t. 639.

NIPAL and SIKKIM, alt. 4000–9000 ft.; plentiful. KHASIA MTS., alt. 4000–6000 ft.; plentiful. BURMA and MALAY PENINSULA; *Griffith, Kurz.*

Stem often 2–6 in., succulent, weak, sometimes 18 in. with thick woody branches. *Leaves* 2–4 in., from ovate to lanceolate, long-acuminate; petiole $\frac{1}{2}$–1 in. *Calyx-tube* glabrous, sometimes with minute bundles of hairs between the bases of the teeth. *Petals* scarcely $\frac{1}{4}$ in. *Fruit* about $\frac{1}{4}$ in., quadrangular, mouth of the calyx-tube very wide. —Triana reduces (*in Trans. Linn. Soc.* xxviii. 77, 78) to this species *Sonerila Naudiniana Miq. Fl. Ind. Bat.* i. pt. i. p. 565 with syn. But Miquel removed this plant from *Sarcopyramis* because it had 6 stamens: there is no authentic specimen of it at Kew.

12. PHYLLAGATHIS, *Blume.*

Herbaceous small shrubs with very short stems. *Leaves* opposite (or the terminal leaf solitary), large, petioled, orbicular, cordate, 7–9-nerved. *Flowers* in a peduncled dense head, purple. *Calyx-tube* campanulate, glabrous or with long bristles near the top, teeth 4 (rarely 3), acute, long-setose. *Petals* 4 (rarely 3), ovate, acute, glabrous. *Stamens* 8 (rarely 6), equal; anthers elongate, scarcely produced at the base, connective without appendage. *Ovary* adnate to the bottom of the calyx-tube, 4- (rarely 3-) celled, glabrous at the apex; style filiform; ovules very numerous, placentas large axile. *Capsule* broadly funnel-shaped, opening by 4 valves at the top. *Seeds* ellipsoid, somewhat obovoid, with glandular hardly raised dots, raphe slightly excurrent along one side of the seed its whole length.—DISTRIB. Species 2; one Malayan, one Bornean.

1. **P. rotundifolia,** *Blume in Flora,* 1831, 507; leaves glabrous or puberulo-glandular beneath, flower-heads with ovate bracts beneath. *Korth. in Verh. Nat. Gesch. Bot.* t. 57; *Naud. in Ann. Sc. Nat. ser.* 3. xv. p. 332; *Bot. Mag.* t. 5282; *Triana in Trans. Linn. Soc.* xxviii. 77. Melastoma rotundifolium, *Jack in Trans. Linn. Soc.* xiv. 12; *DC. Prodr.* iii. 149.

MALACCA; *Griffith, Maingay.* ? TENASSERIM OR ANDAMANS, *Helfer* No. 2266.

Leaves usually 4–9 in. diam., obtuse or acute, entire, usually red beneath; petiole 2–5 in., with long pendent coarse bristles or nearly glabrous. *Bracts* to the flower head red, $\frac{1}{2}$ in. wide and upwards. *Calyx-teeth* from short-ovate with a mucro to ovate-lanceolate attenuate. *Capsule* about $\frac{1}{4}$ in., fruiting pedicel about $\frac{1}{2}$ in.—Helfer's No. 2266, in fruit, shows the capsule trigonous with smooth almost convex faces: the other typical examples show the fruit 6–8-ribbed, the ribs prominent: in all these the fruit is over-ripe and the wall partly broken down. Helfer's plant may be a new species or even a new genus; but the leaves are exceedingly like the well-marked leaves of *Phyllagathis.*

13. MARUMIA, *Blume.*

Twining shrubs; branches round, thickened at the nodes. *Leaves* opposite, short-petioled, coriaceous, elliptic-lanceolate, cordate at the base, 3-nerved from the base besides two submarginal nerves, entire, tomentose beneath. *Cymes* axillary; flowers 3–5, large, pedicelled, purple or white. *Calyx-tube* cylindric,

tomentose (and often bristly or stellate-hairy); lobes 4, persistent. *Petals* 4, obovate. *Stamens* 8, unequal; anthers elongate, opening by a single pore; connective of the longer anthers carrying in front two long bristles and behind often one or two spurs or several twisted bristles. *Ovary* at the base (or half its height) adnate to the calyx, 4-celled, densely hairy at the apex; style filiform; ovules numerous, placentas axile. *Berry* ellipsoid, crowned by the calyx-limb. *Seeds* numerous, oblong-ellipsoid, with glandular scarcely raised dots, raphe slightly excurrent along the whole length of one side.—DISTRIB. Species 10, extending from the southern half of the Transgangetic Peninsula to Borneo and the Philippines.

1. **M. nemorosa,** *Blume in Flora,* 1831, 505; branches rusty closely pubescent subtomentose, calyx-tube rusty closely pubescent stellate-tomentose sometimes scabrous subtuberculate, teeth ovate-lanceolate acuminate. *Naud. in Ann. Sc. Nat. ser.* 3. xv. 279; *Miq. Fl. Ind. Bat.* i. pt. i. 532; *Triana in Trans. Linn. Soc.* xxviii. 82. M. affinis, *Korth. in Verh. Nat. Gesch. Bot.* 241, t. 60; *Miq. l. c.* 533. Melastoma nemorosum, *Jack in Trans. Linn. Soc.* xiv. 8; *DC. Prodr.* iii. 149; *Wall. Cat.* 4043.

PINANG; *Wallich, Schomburgk, Phillips.* MALACCA; *Griffith, Maingay.*—DISTRIB. Borneo, Sumatra.

Leaves 3–4 in., shining, minutely puberulous above, rufous-stellate beneath; petiole $\frac{1}{4}$ in. *Peduncle* 1–2 in.; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. Connective of the longer *anthers* at the base with two long bristles in front and several short twisted hairs behind.

2. **M. zeylanica,** *Blume in Flora,* 1831, 505; branches rusty closely pubescent or subtomentose and with scattered spreading long bristles, calyx-tube rufous-stellate tomentose and with spreading bristles $\frac{1}{5}$ in., teeth triangular-lanceolate. *Blume Rumph.* t. 5; *Triana in Trans. Linn. Soc.* xxviii. 82. M. echinulata, *Naud. in Ann. Sc. Nat. ser.* 3. xv. 280; *Miq. Fl. Ind. Bat.* i. pt. i. 534. Melastoma rhodocarpum, *Wall. Cat.* 4045.

MALACCA; *Maingay.* SINGAPORE; *Wallich, Walker, T. Anderson.*—DISTRIB. Malaya to the Philippines.

Leaves 3–4 in., shining above, rufous-stellate beneath; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Peduncle* 1 in., pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. Connective of the longer *anthers* at the base with two long bristles in front and several short twisted hairs behind.

VAR. *subglabrata*; leaves beneath glabrous except the nerves. Singapore, *T. Anderson.*

3. **M. reticulata,** *Blume Mus. Bot.* i. 34; branches rusty tomentose and with spreading scattered long bristles, calyx-tube rufous-stellate tomentose and with spreading bristles $\frac{1}{4}$ in. from clustered tubercular bases, teeth short triangular in the bud ovate rounded reflexed after flowering tomentose within. *Triana in Trans. Linn. Soc.* xxviii. 82. M. stellulata, *Korth. in Verh. Nat. Gesch. Bot.* 243, *not of Blume.*

MALAY PENINSULA; *Griffith* (Kew Distrib. No. 2269). MALACCA; *Maingay* No. 784.—DISTRIB. Sumatra and Java.

Leaves 2–3$\frac{1}{2}$ in., shining impressed-reticulate above, with scattered stellate pubescence beneath: petiole $\frac{1}{3}$ in. *Peduncles* $\frac{1}{2}$–1 in., chiefly from the upper axils forming a quasi-terminal panicle; pedicels $\frac{1}{4}$ in. Connective of the longer *anthers* at the base with two long bristles in front; anthers very long, sigmoid.—M. oligantha, *Naud. in Ann. Sc. Nat. ser.* 3. xv. 300; *Miq. Fl. Ind. Bat.* i. pt. i. 534 is said by Triana to be also a syn. of *M. reticulata, Blume.*

14. DISSOCHÆTA, *Blume.*

Shrubs, usually twiners. *Leaves* opposite, petioled or nearly sessile, elliptic or oblong-lanceolate, rounded at the base, 3-nerved from the base besides two submarginal nerves, entire. *Flowers* large or small, in terminal sometimes leafy panicles, purple or white, bracts large or small. *Calyx-tube* campanulate-cylindric, densely stellate-tomentose pubescent or glabrous; limb obscurely 4-lobed, more rarely distinctly 4-toothed, persistent. *Petals* 4. *Stamens* 8, unequal, 4 shorter sometimes wanting, connective of the 4 longer with 2 long bristles in front at the base (in all the Indian species). *Ovary* adnate to the calyx, 4-celled, apex glabrous or densely hairy; style filiform; ovules very many, placentas axile. *Berry* ovoid or elliptic, crowned with the calyx-limb. *Seeds* ellipsoid, flattened on the side of the raphe.—DISTRIB. Species 16, extending from Pinang and Malacca throughout Malaya to the Philippines.

* *Anthers very long, attenuate upwards.*

1. **D. annulata,** *Hook. f. ms.*; *Triana in Trans. Linn. Soc.* xxviii. 83; branches panicle and leaves beneath with much rufous stellate tomentum, panicle narrow leafy with large bracts to the young flowers, calyx-tube of the buds more than ½ in. densely woolly-rufous and stellate-hairy, teeth distinctly triangular. Melastoma bracteatum, *Wall. Cat.* 4044, *partly.*

PINANG; *Wallich, Griffith* (Kew Distrib. No. 2268). Mount Ophir, MALACCA, *Maingay* No. 788.—DISTRIB. Borneo.

Leaves 3–4½ in., glabrous above or minutely pubescent on the nerves; petiole ¼ in. *Panicle* consisting of axillary cymes (exactly resembling that of *Marumia reticulata*); bracts ¾ in., oblong, caducous; pedicels less than ¼ in. *Fruit* (not ripe) ellipsoid, calyx-mouth enlarged, teeth somewhat rounded.—The stem of this plant has rings at the nodes as in *Marumia*: its natural affinity seems altogether with *Marumia reticulata* and *M. nemorosa*: it recedes from *M. reticulata* only by the absence of the long bristles on the calyx-tube so common in *Marumia*; from *M. nemorosa* it recedes by the quasi-paniculate inflorescence and the absence of any twisted hairs at the base of the connective *other than* the two long bristles in front.

2. **D. punctulata,** *Hook. f. ms.*; *Triana in Trans. Linn. Soc.* xxviii. 83; branches and panicle densely closely dark-red furfuraceous, panicle narrow not leafy, bracts small linear deciduous, calyx-tube $\frac{1}{5}$–¼ in. densely dark-red furfuraceous, teeth short triangular in the expanded flower.

MALACCA; *Griffith* (Kew Distrib. No. 2291); *Maingay* No. 789. SINGAPORE and PINANG; *Walker.*

Leaves 2½–3½ in., glabrous above, with scattered dark-red stellate hairs beneath; petiole $\frac{1}{5}$–$\frac{3}{8}$ in. *Panicle* terminal, pedicels hardly more than ⅛ in. *Fruit* (not ripe) campanulate (seems about to become ovoid), calyx-teeth not then prominent, nor the mouth enlarged.

3. **D. bracteata,** *Blume in Flora,* 1831, 495; branches upwards and panicle with small stellate pubescence, panicle somewhat spreading not leafy, bracts large oblong longer than the expanding buds, calyx-tube of the buds ¼–⅓ in. with more or less stellate pubescence limb (in the bud) nearly entire or very obscurely 4-toothed. *Miq. Fl. Ind. Bat.* i. pt. i. 529; *Triana in Trans. Linn. Soc.* xxviii. 84. D. bracteosa, *Naud. in Ann. Sc. Nat. ser.* 3. xv. 76; *Miq. Fl. Ind. Bat.* i. pt. i. 527. Melastoma bracteatum, *Jack in Trans. Linn. Soc.* xiv. 9; *Wall. Cat.* 4044, *partly.*

PINANG; *Wallich, Porter.* MALACCA; *Maingay* No. 791, 793.

Leaves 2½–3½ in., glabrous above, with scattered stellate hairs beneath; petiole ¼ in. *Pedicels* 0–¼ in. *Petals* rose (Jack). *Fruit* ellipsoid, mouth of the calyx enlarged.—Maingay's example No. 791 has larger flowers than the Wallichian types but appears to agree otherwise: the fruits in Maingay's examples are more than ½ in. long (though not ripe).

4. **D. pallida,** *Blume in Flora,* 1831, 500; branches and panicle minutely puberulous with microscopic stellate often evanescent hairs, panicle somewhat spreading not leafy with minute lanceolate caducous bracts, calyx-tube of the buds $\frac{1}{4}$–$\frac{1}{3}$ in. minutely puberulous or glabrous, limb (in the bud) nearly entire or very obscurely 4-lobed. *Naud. in Ann. Sc. Nat. ser.* 3. xv. 77, t. xv. f. 4; *Miq. Fl. Ind. Bat.* i. pt. i. 528; *Triana in Trans. Linn. Soc.* xxviii. 83. D. superba, *Naud. l. c.*; *Miq. l. c.* D. ovalifolia, *Naud. l. c.* 76; *Miq. l. c.* 527. D. astrosticta, *Miq. Fl. Ind. Bat. Suppl.* 318. Melastoma pallida, *Jack in Trans. Linn. Soc.* xiv. 12; *DC. Prodr.* iii. 150; *Wall. Cat.* 4049.

PINANG; *Wallich.* MALAY PENINSULA; *Griffith* (Kew Distrib. No. 2292). SINGAPORE, PINANG &c.; *Walker, Maingay* No. 792.—DISTRIB. Malaya Archipelago.

Leaves attaining 6 by 3¼ in., glabrous above, dotted beneath with separate stellate minute hairs; petiole ¾ in. *Pedicels* less than ¼ in. *Fruit* ovoid, mouth of the calyx much enlarged.—The 4 shorter stamens are sometimes obsolete, which accounts for the multiplication of species here by authors.

** *Anthers short, oblong, truncate, not narrowed upwards.*

This section is much more distinct from section * than the latter is from *Marumia*; there is no case of intermediate anthers, they are either decidedly truncate or very elongate. The three species of this section ** are very closely allied; the panicle is large and lax, the ultimate pedicels short, the bracts caducous, the flowers small, the calyx-limb from the bud truncate or only very obscurely 4-lobed.

5. **D. intermedia,** *Blume in Flora,* 1831, 493; leaves beneath and panicle stellately tomentose sometimes ferruginous, fruit ¼ in. broad more or less pubescent crowned by the enlarged calyx-mouth not distinctly ribbed. *Naud. in Ann. Sc. Nat. ser.* 3. xv. 72; *Miq. Fl. Ind. Bat.* i. pt. i. 524; *Triana in Trans. Linn. Soc.* xxviii. 83. Melastoma rubiginosum, *Wall. Cat.* 4052, *partly.*

PINANG and SINGAPORE; *Wallich.* MALAY PENINSULA, *Griffith* (Kew Distrib. No. 2287), *Helfer* (Kew Distrib. No. 2286).—DISTRIB. Malay Archipelago.

Leaves 3 in.; petiole $\frac{1}{5}$ in. Nodes of *panicle* often much thickened. *Flowers* rather larger than in the two following species.

6. **D. celebica,** *Blume Mus. Bot.* i. 36; leaves beneath and panicle rufous-stellate tomentose, fruit less than $\frac{1}{5}$ in. broad minutely pubescent ribbed, calyx-limb caducous leaving only a scar. *Miq. Fl. Ind. Bat.* i. pt. i. 530; *Triana in Trans. Linn. Soc.* xxviii. 83. D. microcarpa, *Naud. in Ann. Sc. Nat. ser.* 3. xv. 72; *Miq. l. c.* 523. D. bancana, *Miq. l. c.* 529. Melastoma fallax, *Wall. Cat.* 4050; ? *Jack in Trans. Linn. Soc.* xiv. 13. M. rubiginosum, *Wall. Cat.* 4052, *partly.*

PINANG; *Wallich.* MALAY PENINSULA; *Griffith* (Kew Distrib. No. 2288). MALACCA; *Maingay* No. 790. SINGAPORE; *T. Anderson.*—DISTRIB. Malay Archipelago.

Leaves 3 in.; petiole $\frac{1}{5}$ in. Nodes of *panicle* often much thickened.—Not well distinct from the preceding species.

7. **D. gracilis,** *Blume in Flora,* 1831, p. 498; leaves beneath and panicle glabrous or very nearly so, fruit less than $\frac{1}{5}$ in. broad glabrous ovoid much nar-

rowed upwards, calyx-mouth appearing only as a scar. *Korth. Verh. Nat. Gesch. Bot.* 267; *Naud. in Ann. Sc. Nat. ser.* 3. xv. 75; *Miq. Fl. Ind. Bat.* i. pt. i. 526; *Triana in Trans. Linn. Soc.* xxviii. 83. Melastoma gracile, *Jack in Trans. Linn. Soc.* xiv. 14; *DC. Prodr.* iii. 149. M. fallax, *Wall. Cat.* 4080. ? M. glauca, *Griff. Ic. Pl. Asiat.* 637.

PINANG and SINGAPORE; *Wallich.*—DISTRIB. Malay Archipelago.

Leaves 3 in.; petiole sometimes ¾ in. Nodes of *panicle* often thickened. *Stamens* 8 or 4, as in the two preceding species. *Petals* nearly white (Jack). *Bracts* ¼ in., oblong, much exceeding the expanding buds.

15. ANPLECTRUM, *A. Gray.*

Twining shrubs. *Leaves* opposite, short-petioled, entire, oblong, narrowed upwards, 3–5-nerved from the base. *Flowers* not large, white, in terminal panicles sometimes leafy at the base. *Calyx-tube* ovoid, limb obscurely 4-lobed or truncate. *Petals* 4. *Stamens* 4 perfect; anthers attenuated upwards, opening by one pore, connective at base shortly appendaged or subnude, never with two long bristles in front; imperfect stamens 4, 2, or 0, with a rudimentary anther often bicaudate. *Ovary* 4-celled, free at the apex, with 4 vertical ridges; style simple; ovules many, placentas axile. *Berry* ovoid or globose, crowned with the calyx-limb. *Seeds* very many, small, falcate, obovoid; raphe long, lateral.—DISTRIB. Species 12, extending from Mergui, Pinang and Singapore to Borneo, and the Philippines.

1. **A. glaucum,** *Triana in Trans. Linn. Soc.* xxviii. 84 *excl. many of the syn.*; leaves 4–6 in. from a broad or subcordate base glabrous beneath suddenly narrowed into a short obtuse subcaudate tip. A. cyanocarpum, *Kurz in Journ. As. Soc.* 1877, pt. ii. 78, *not of Triana.* Dissochæta spoliata, *Naud. in Ann. Sc. Nat.* ser. 3. xv. 69, t. 4, fig. 1; *Miq. Fl. Ind. Bat.* i. pt. i. 521. Melastoma cernuum, *Wall. Cat.* 4054, *not of Roxb.* M. glaucum, *Wall. Cat.* 4055. Osbeckia tetrandra, *Roxb. Fl. Ind.* ii. 224.

PINANG; *Wallich.* MERGUI and MALAY PENINSULA; *Griffith* (Kew Distrib. No. 2289); *Maingay* No. 793–2. TENASSERIM OR ANDAMANS; *Helfer* (Kew Distrib. No. 2290).—DISTRIB. Malay Archipelago.

Flowers cernuous. Shorter *stamens* 4, 2 or 0. *Fruit* $\frac{1}{8}$–$\frac{1}{10}$ in. broad. *Pedicels* and calyx-tube minutely puberulous, plant otherwise glabrous.—*A. cyanocarpum,* Triana, has the stem somewhat thickly covered with long spreading bristles. None of the plants collected within the area of the Indian Flora show such bristles: the two species may not be distinct, but Mr. Kurz, while not uniting them, says that Helfer's No. 2290 is Triana's *A. cyanocarpum,* which must be wrong, as Triana has written *A. glaucum* on Helfer's No. 2290.

2. **A. pallens,** *Blume Mus. Bot.* i. 38; leaves 1½–2½ in. glabrous or minutely puberulous beneath 3-nerved (scarcely 5-nerved) suddenly narrowed into a long obtuse subcaudate tip. *Naud. in Ann. Sc. Nat.* ser. 3. xv. 304; *Miq. Fl. Ind. Bat.* i. pt. i. 554; *Triana in Trans. Linn. Soc.* xxviii. 84. Melastoma petiolare, *Wall. Cat.* 4053.

PINANG; *Wallich, Porter.* MALACCA; *Maingay* No. 795, 2663.—DISTRIB. Sumatra, Borneo.

Shorter *stamens* usually 0. *Fruit* $\frac{1}{8}$ in. broad, glabrous. Young *calyx-tube* often minutely but densely rufous tomentose.—Some of the Archipelago examples have leaves 4½ in. and are then very like *A. glaucum.*

3. **A. divaricatum,** *Triana in Trans. Linn. Soc.* xxviii. 84, *partly*; branchlets panicles and leaves beneath with ferruginous stellate tomentum. Dissochæta anceps, *Naud. in Ann. Sc. Nat.* ser. 3. xv. 70. D. palembanica, *Miq. Fl. Ind. Bat. Suppl.* 317. D. glauca, *Blume in Flora*, 1831, p. 501. Melastoma glauca, *Jack in Trans. Linn. Soc.* xv. 15. M. polyanthum, *Benth. in Wall. Cat.* 4051.

PINANG; *Wallich, Walker.* MALACCA; *Griffith, Maingay* No. 794; *Cuming*, No. 2259.—DISTRIB. Java to Philippines.

Leaves usually 2–$2\frac{1}{2}$ in., oblong, acute, glabrous above or rufous stellate-tomentose on the nerves; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. Young *calyx-tube* densely stellate-tomentose. Shorter *stamens* often 2, sometimes 4 or 0. *Fruit* less than $\frac{1}{5}$ in. broad, finally glabrous.

4. **A. annulatum,** *Triana in Trans. Linn. Soc.* xxviii. 84; branches nearly glabrous but with scattered patent bristly hairs, more thickened at the nodes than the other species and with a ring of dense rufous tomentum below each node, leaves nearly glabrous beneath. Melastoma annulatum, *Wall. Cat.* 4056.

PINANG; *Porter.*

Leaves 4–5 in., glabrous, oblong, cordate at the base; petiole $\frac{1}{8}$–$\frac{1}{5}$ in., with spreading bristles. *Panicle* with spreading bristles, and rufous-tomentose. Young *calyx* rufous-tomentose. *Fruit* $\frac{1}{3}$ in. broad, ovoid, ultimately glabrous or nearly so.

DOUBTFUL SPECIES.

5032 A. ASSAMICUM, *C. B. Clarke*; stem with coarse spreading bristles somewhat annulated at the nodes, leaves very large short-petioled elliptic-lanceolate with spreading bristly hairs on the nerves beneath otherwise glabrous.

ASSAM, foot of the Naga Hills, and BHOTAN, *Griffith* (Kew Distrib. No. 2285).

Branches stout. *Leaves* 5–7 in., very acute, cordate at the base; petiole $\frac{1}{8}$–$\frac{1}{4}$ in., densely coarsely bristly. *Panicle* (in fruit) terminal, large, repeatedly trichotomous; fruits very numerous (like those of *Anplectrum*), smooth, campanulate at the base (not ripe $\frac{1}{3}$ in. broad).—*Flowers* not seen.

A. BARBATUM, *Triana in Trans. Linn. Soc.* xxviii. 84; Melastoma? barbatum, *Wall. Cat.* 4082 from Chappedong in Martaban.

The Wallichian example exhibits neither inflorescence, flowers nor fruit, and is indeterminable. Leaves 4 in., ovate, shortly acuminated, glabrous; petiole $\frac{1}{2}$ in., glabrous but with a dense erect fringe of rusty bristles on its upper face; stem nearly glabrous.

16. **MEDINILLA,** *Gaud.*

Branching shrubs, erect or scandent. *Leaves* opposite or whorled, entire, often fleshy, glabrous in all the Indian species, usually longitudinally 3–9-nerved. *Flowers* in terminal panicles or lateral cymes, white or rose, with or without bracts, 4- or 5- rarely 6-merous. *Calyx-tube* ovoid or cylindric, limb truncate or obscurely toothed. *Stamens* twice as many as the petals, equal or nearly equal (rarely unequal); anthers opening at the top by one pore; connective not (or very shortly) produced at the base but having two tubercles in front and a spur behind. *Ovary* inferior, 4–6-celled, usually glabrous at the apex; style filiform; ovules very many, placentas axile. *Berry* crowned by the limb of the calyx.—*Seeds* very many, ovoid or subfalcate, raphe often thickened and excurrent.—DISTRIB. Species 50; mainly in Malaya, East Bengal and Ceylon; a few are found in the Fiji Archipelago and in the East African islands.

* Flowers in axillary cymes (*see also* 10. M. himalayana).

† *Leaves whorled.*

1. **M. rosea,** *Gaud. in Freyc. Voy. Bot.* 484, t. 106; branches round, leaves obovate-oblong 3-nerved the two lateral nerves near the margin, flowers 4-merous. *Naud. in Ann. Sc. Nat.* ser. 3. xv. 286; *Triana in Trans. Linn. Soc.* xxviii. 85.

MALACCA, Mount Ophir; *Griffith* (Kew Distrib. No. 2282), *Maingay* No. 796.—DISTRIB. Marianne Islands.

Leaves 1½ in.; petiole ¼ in. *Cymes* 3–10-flowered. *Flowers* large. *Anthers* shortly produced at the base, connective having a short spur. *Berry* nearly ¼ in. broad, ovoid. *Seeds* falcate-ellipsoid, raphe not excurrent.

2. **M. macrocarpa,** *Blume Rumph.* i. 14, t. 2; branches round, leaves obovate-oblong acute 3-nerved, flowers 5-merous. *Naud. in Ann. Sc. Nat.* ser. 3. xv. 293; *Miq. Fl. Ind. Bat.* i. pt. i. 544; *Triana in Trans. Linn. Soc.* xxviii. 86.

MALACCA; *Maingay* No. 799.—DISTRIB. Malay Archipelago.

Leaves 2½–4 in.; petiole ½–¾ in. *Cyme* 3–10-flowered. *Flowers* large. *Calyx-limb* even in the bud truncate entire in Maingay's examples. *Anthers* long, produced at the base, spur of the connective long. *Berry* ⅓ in. wide, hardly narrowed upward. *Seeds* falcate-ellipsoid, smooth, raphe not excurrent.

†† *Leaves opposite.*

3. **M. Hasseltii,** *Blume in Flora* 1831, p. 513; branches round verrucose, leaves lanceolate, flowers 4-merous, fruit ovoid, calyx-rim not produced far above the fruit, seeds obovoid smooth slightly flattened on the side of the raphe which is not produced. *Miq. Fl. Ind. Bat.* i. pt. i. 542. M. crassifolia, *Triana in Trans. Linn. Soc.* xxviii. 86, *partly*. Melastoma laurifolium, *Wall. Cat.* 4084.

SINGAPORE; *Wallich*. MALACCA; *Maingay* No. 797.—DISTRIB. Java, Sumatra.

Leaves 4–7 in., 3-nerved, an obscure pair of nerves very near the margin sometimes added, very acuminate, narrowed at the base in the Indian examples (less so in Blume's authentic specimen); petiole ⅛–¼ in. *Anthers* at the base distinctly but shortly produced, spur of the connective short. *Fruit* ⅓ in. diam.—Reduced to *M. crassifolia* by Triana; but, as Blume observes, the leaves are much longer, with shorter petioles, and the flowers 4-merous. The true *M. crassifolia*, Blume, has not been found in British India.

VAR. *Griffithii*; cymes lateral on short peduncles but greatly developed repeatedly divided with opposite branches at right angles and sometimes 40 flowers on one cyme.—Mount Ophir, Malacca; *Griffith* (Kew Distrib. No. 2282).

4. **M. rubicunda,** *Blume in Flora,* 1831, 512; branches round somewhat striated, leaves elliptic or lanceolate, flowers 4-merous, fruit ovoid, calyx-rim very short, seed obovoid smooth slightly flattened on the side of the raphe which is not produced. *Naud. in Ann. Sc. Nat.* ser. 3. xv. 288, t. 13, fig. 1; *Miq. Fl. Ind. Bat.* i. pt. i. 539; *Triana in Trans. Linn. Soc.* xxviii. 86. M. erythrophylla, *Lindl. in Paxt. Mag. Bot.* x. 79; *Naud. l. c.* 289; *Miq. l. c.* 540. Melastoma rubicunda, *Jack in Trans. Linn. Soc.* xiv. 18; *DC. Prodr.* iii. 148; *Wall. Cat.* 4086. M. erythrophyllum, *Wall. Cat.* 4085.

SUBTROPICAL HIMALAYA from SIKKIM eastward. KHASIA MTS., alt. 2000–5000 ft., common. PINANG; *Wallich*.—DISTRIB. Sumatra.

Leaves 2–6 in., narrowed at both ends, 3–5-nerved, one pair of nerves often starting ¼ in. above the base of the leaf; petiole 0–½ in. *Peduncles* rarely 1 in.

Anthers at the base very shortly produced, spur of the connective very short. *Fruit* $\frac{1}{8}$–$\frac{1}{5}$ in. diam., when ripe black, edible though insipid, rim of the calyx then evanescent.—This plant really differs little from *M. Hasseltii*; but in its typical form the leaves are elliptic nearly sessile: also the anthers at the base and the spur of the connective are even shorter.

5. **M. fuchsioides,** *Gardn. in Calc. Journ. Nat. Hist.* viii. 12; branches round somewhat striated, leaves subsessile elliptic-oblong subcuneate at the base, peduncles 1–3-flowered, flowers 4-merous. *Thwaites Enum.* 106; *Triana in Trans. Linn. Soc.* xxviii. 86.

CEYLON; *Gardner*; Newera Ellia and Horton Plains, *Thwaites*.

Leaves 2–3½ in., 3–5-nerved, minutely glandular beneath (Thwaites). *Peduncles* solitary; pedicels and calyx rose-purple. *Petals* a fine lake below, white at top. *Anthers* shortly produced at the base, connective with a short spur. *Fruit* ⅓ in. diam., subglobose.—The specimens of this very succulent plant are imperfect and the above description is mainly compiled from Gardner and Thwaites' description.

6. **M. maculata,** *Gardn. in Calc. Journ. Nat. Hist.* viii. 13; branches quadrangular angles waved winged, leaves subsessile ovate obtuse or oblong obscurely crenate, peduncles 1–3-flowered, flowers 4-merous small. *Thwaites Enum.* 106; *Triana in Trans. Linn. Soc.* xxviii. 86, *excluding the syn. Don.*

CEYLON; Central Provinces, alt. 3000–5000 ft., *Thwaites, Macrae, Walker*.

Leaves ¾–1½ in., 3-nerved, minutely glandular beneath (Thwaites). *Calyx-tube* green-red. *Petals* ⅕ in., pale-rose. *Anthers* shortly produced at the base, connective with a short spur. *Fruit* ⅛ in. broad, very small, subcampanulate.

VAR. *Thwaitesii*, leaves cuneate-obovate.—Ceylon; Hellesseen, Pasdoon Corle, *Thwaites* No. 3443.

7. **M. Beddomei,** *C. B. Clarke*; branches round, leaves short-petioled orbicular or broad-elliptic, peduncles 1-flowered, flowers 4-merous large. M. radicans, *Bedd. Ic. Pl. Ind. Or.* t. 184, *not of Blume*. Triplectrum radicans, *W. & A. Prodr.* 324.

WESTERN PENINSULA; KURG, *Wight*. WYNAAD, alt. 2000–3500 ft., *Beddome*.

Leaves 1–1½ in., 3-nerved, much thicker than those of *M. maculata*. *Petals* (in Wight's own No. 1151) more than ½ in. Beddome says the flowers are "14–15 lines long." *Anthers* prominently produced at the base, spur of the connective also prominent; four additional imperfect stamens sometimes present (*ex Beddome*).—This plant wholly differs from *M. maculata* (with which Triana unites it doubtfully) by its much larger flowers as well as different leaves and anthers. It does not appear however that Triana ever saw Wight's No. 1151. Nor did Beddome, who doubts if it can be the same as his *M. radicans*: with which however it agrees perfectly.

8. **M. malabarica,** *Bedd. Ic. Pl. Ind. Or.* 157; branches round striate somewhat verrucose, leaves 2–3 in. elliptic narrowed to both ends 3–5-nerved, petiole less than ¼ in., flowers 4-merous, anthers oblong short truncate subnude at base.

ANAMALLAYS and NILGHIRIS, alt. 3000–4000 ft.; *Beddome*.

Peduncles axillary, 1–3-flowered. *Flowers* large. *Filaments* long, anthers short with two glandular swellings at the apex of the filament inside, spur of the connective perceptible behind but very small.—This species in leaves and inflorescence is much like *M. rubicunda*; but in its anthers it is altogether remote, and approaches *Pachycentria*.

** Flowers in terminal panicles or quasi-lateral cymes.

9. **M. speciosa,** *Blume in Flora* 1831, 515; branches thick smooth with numerous erect bristles at the nodes, leaves 6–10 in. in whorls of 4 or 3 less often in pairs subsessile obovate-lanceolate 7–9-nerved one pair of nerves starting 1–4 in. above the base of the leaf. *Bot. Mag.* t. 4321; *Naud. in Ann. Sc. Nat.* ser. 3. xv. 291; *Miq. Fl Ind. Bat.* i. pt. i. 540; *Triana in Trans. Linn. Soc.* xxviii. 87. Melastoma eximium, *Blume Bijd.* 1072, *not of Jack.*

MALAYA; *Maingay* No. 798.—DISTRIB. Java, Moluccas.

Panicle long, branches whorled; bracts ¼ in., narrow obovate-lanceolate; pedicels calyx and petals rose. *Anthers* shortly produced at the base, spur of the connective short. *Fruit* $\frac{1}{5}$–¼ in. broad, ovoid, rim of the calyx shortly produced above the fruit.

10. **M. himalayana,** *Hook. f.*; *Triana in Trans. Linn. Soc.* xxviii. 88; branches round smooth striate, leaves nearly sessile broadly elliptic, cymes terminal and quasi-lateral trichotomous, peduncles 1–1½ in., pedicels divaricate in fruit.

SIKKIM; alt. 3000–6000 ft.; *J. D. H.* KHASIA MTS.; Surareem, alt. 5000 ft.; *J. D. H., C. B. Clarke.*

Leaves 2½ in., 3–5-nerved almost from the base, obtusely acuminate; petiole not $\frac{1}{8}$ in. *Flowers* ⅔ in. diam., rose. *Anthers* 2-tubercled at the base, connective without a spur. *Berry* ⅓ in. diam., spherical.—This species has been confounded in herbaria with *M. rubicunda,* which is found over the same area. In *M. himalayana* the terminal panicle is small and often only quasi-axillary panicles are seen: but the peduncle is much longer than in *M. rubicunda* and the branches of the panicle in fruit are divaricate, not ascending as in *M. rubicunda.*

11. **M. pauciflora,** *Hook. f.*; *Triana in Trans. Linn. Soc.* xxviii. 88; ultimate branchlets subquadrangular, leaves sessile elliptic, cymes terminal very short few-flowered.

SIKKIM at Darjeeling; *Herb. Griffith* (Kew Distrib. No. 2283).

Leaves 1½ in., 3-nerved from the base, abruptly acuminate. *Flowers* ⅔ in. diam., very shortly pedicelled. *Calyx-tube* campanulate, limb obscurely 4-toothed. *Anthers* small, linear, with two tubercles at the base, connective without a spur.—Only one example of this has been seen: the inflorescence is strictly terminal; the locality is not quite certain and may be "East Himalaya."

IMPERFECTLY KNOWN AND DOUBTFUL SPECIES.

M. MAINGAYI, *C. B. Clarke*; glabrous, branches round smooth, leaves 1–1½ in. opposite sessile cuneate-obovate obtuse 3-nerved, flowers 4-fid, petals ¼ in., anthers oblong narrowed upwards opening by a terminal pore with two tubercles at base and no distinct spur on the connective, seeds oblong elliptic smooth larger than in the other species of *Medinilla.*—MALACCA; *Maingay* No. 807, 806.

There is nothing to show the nature of the inflorescence or the shape of the berry.

M. GRIFFITHII, *C. B. Clarke*; glabrous, branches round remotely verrucose, leaves 5–7 in. elliptic acuminate at both ends 3-nerved, petiole ½–¾ in., inflorescence in weak axillary cymes, fruit small, seeds of the genus.—MISHMEE; *Griffith* (Kew Distrib. No. 2281).

This differs by its large long-petioled leaves from all the other species.

M. MERGUIENSIS, *C. B. Clarke*; glabrous, branches round smooth, leaves 2–3¼ in. obovate-elliptic obtuse 3-nerved, petiole $\frac{1}{8}$–$\frac{1}{5}$ in., cyme compound, anthers oblong narrowed upwards with a terminal pore, a long spur to the connective near the base but the tubercles at the apex of the filament very obscure.—MERGUI; *Griffith* (in Herb. Wight).

Only a detached fragment of the panicle is preserved. This may be a *Pachycentria.*

17. **POGONANTHERA,** *Blume.*

Shrubs, nearly glabrous; branches round, minutely scaly. *Leaves* opposite, petioled, oblong or ovate, entire, glabrous, 3-nerved. *Flowers* small, pulverulent, in small terminal panicles having opposite branches. *Calyx-tube* campanulate, subquadrangular; limb 4-toothed. *Petals* 4, lanceolate. *Stamens* 8, equal; anthers oblong, acute, opening by a terminal pore, not produced at the base; connective at the base bearded behind with a tuft of hairs, not spurred. *Ovary* half-inferior, 4-celled, with a tuft of hairs at the apex; style filiform; ovules very many, placentas axile. *Berry* small, globose, 4-celled, crowned with the calyx-limb. *Seeds* very many, obovoid-oblong, smooth.—DISTRIB. Species 2; in Malaya from Malacca to Borneo.

1. **P. pulverulenta,** *Blume in Flora*, 1831, 521; *Korth. Verh. Nat. Gesch. Bot.* t. 65; *Griff. Notul.* iv. 678; *Miq. Fl. Ind. Bat.* i. pt. i. 553; *Triana in Trans. Linn. Soc.* xxviii. 89. Melastoma reflexa, *Blume l. c.*; *Naud. in Ann. Sc. Nat.* ser. 3. xv. 303; *Triana l. c.* M. pulverulentum, *Jack in Trans. Linn. Soc.* xiv. p. 19; *DC. Prodr.* iii. 149; *Blume Bijd.* 1072. M. rubicundum, *Jack l. c.* 18; *DC. l. c.* 148; *Wall. Cat.* 4086.

MALACCA and SINGAPORE; *Wallich, Griffith, Maingay*.—DISTRIB. Through Malaya to Borneo.

Leaves 3–4½ by 1–2½ in., narrowed to both ends, 3-nerved with sometimes other two faint nerves close to the margin; petiole ¼–½ in., with two tubercles or auricles at its apex. *Panicle* 2–3 in. and as much broad, short-peduncled, with minute bracts at the divisions. *Berry* about ⅛ in. broad, narrowed beneath the small calyx-limb.—Blume distinguishes as *P. reflexa*, a form with white transparent petals having a minute tooth on each margin, and which occurs creeping on rocks near the seashore as noted by Jack and Griffith, from the typical *P. pulverulenta* which occurs in the forests, and which has red petals powdered with yellow and a tooth on each side. The distinction between the limb of the petal being toothed or only tumid cannot be traced in the dried specimens: and Blume's subsidiary distinctions regarding the texture of the leaves and the presence or absence of the extra pair of submarginal veins do not hold. Jack named the white-flowered form *rubicundum* because the panicle and calyces are in it a fine rose-purple.

18. **ASTRONIA,** *Blume.*

Shrubs with round branches. *Leaves* opposite, petioled, ovate or oblong, entire, 3-nerved. *Flowers* in terminal panicles, small, white or purple. *Calyx-tube* campanulate, glabrous or puberulous; limb irregularly truncate or 3–8-lobed. *Petals* 4–5. *Stamens* 8–10–12, equal; filaments short, broad; anthers short, obtuse, opening by slits down the front, connective spurred at the base or unappendaged. *Ovary* inferior, 2–5-celled, glabrous at the apex; style short, stigma capitellate; ovules numerous, placentas axile, nearly basal. *Capsule* finally breaking up irregularly. *Seeds* very many, linear, raphe excurrent.—DISTRIB. Species 12; in Malaya, the Fiji and Navigator groups and Tahiti.

1. **A. smilacifolia,** *Triana in Trans. Linn. Soc.* xxviii. 152; glabrous, panicle and calyx-tube minutely brown-rufous tomentose, calyx-limb minutely 5-lobed. Melastoma smilacifolia, *Wall. Cat.* 4057.

PINANG; *Wallich*. MALAYA; *Maingay* No. 808.

Leaves 4–5 in., lanceolate and broad-lanceolate, narrowed to both ends; petiole $\frac{1}{2}$–$1\frac{1}{2}$ in. *Panicle* 1–3 in., ultimate pedicels 0–$\frac{1}{8}$ in. *Petals* less than $\frac{1}{8}$ in., obovate. *Capsule* $\frac{1}{8}$–$\frac{1}{5}$ in. broad, ovoid or hemispheric.

19. **PTERNANDRA,** *Jack.*

Glabrous shrubs with round branches. *Leaves* opposite, sessile or short-petioled, ovate or lanceolate, entire, coriaceous, 3-nerved. *Flowers* small, in axillary (and terminal) small cymes or panicles. *Calyx-tube* verrucose, campanulate; limb truncate, obscurely 4-toothed. *Petals* 4, blueish or white. *Stamens* 8, equal; filaments short, subulate; anthers broad-oblong, obtuse at both ends, opening by slits, connective simple at the base or very shortly spurred behind. *Ovary* inferior, 4-celled, apex flat glabrous; style long, stigma clavate; ovules very many, placentas sub-basal. *Berry* ovoid, truncate. *Seeds* very many, cuneate-obovoid, raphe excurrent on one side towards the end, somewhat angular.—DISTRIB. Species 6 (or perhaps 2 only), from Pinang and Malacca through Malaya to the Philippines.

1. **P. cærulescens,** *Jack in Mal. Misc.* ii. 61; leaves $2\frac{1}{2}$–$4\frac{1}{2}$ in. ovate or lanceolate, stamens blue. *Wall. Cat.* 4077; *Triana in Trans. Linn. Soc.* xxviii. 153; *Kurz For. Fl.* i. 509 *and in Journ. As. Soc.* 1877, pt. ii. 79. Ewyckia cyanea, *Blume Rumph.* i. 24, t. 8; *Miq. Fl. Ind. Bat.* i. pt. i. 568; *Triana l. c.* E. Jackiana, *Walp. Rep.* v. 724. E. paniculata, *Miq. Fl. Ind. Bat. Suppl.* 321 *ex Kurz.* Apteuxis trinervis, *Griff. Notul.* iv. 672.—Nov. Gen. *Roxb. Fl. Ind.* ii. 225.

PINANG and MALACCA; *Wallich.* MERGUI; *Griffith.* TENASSERIM; *Helfer.* NICOBARS; *Kurz.* Malacca; *Cuming, Griffith.*—DISTRIB. Through Malaya to the Philippines.

Leaves narrowed at the base; petiole 0–$\frac{1}{8}$ in. *Panicles* 1–3 in., terminal and in the upper axils, very short-peduncled, often crowded with many flowers, ultimate pedicels very short, bracts minute. *Berry* $\frac{1}{5}$ in. broad, narrower at the mouth.

VAR. *Jackiana*; petioles attaining $\frac{1}{4}$ in., cymes axillary few-flowered.—Malacca; *Griffith*; *Maingay* No. 801.

2. **P. capitellata,** *Jack in Mal. Misc.* ii. *Addenda prefixed to the paper* p. 3; leaves 6–8 in. ovate or broad-elliptic, cymes hardly 1 in. axillary few-flowered dense. *Wall. Cat.* 4079; *W. & A. Prodr.* 325; *Triana in Trans. Linn. Soc.* xxviii. 153; *Kurz For. Fl.* i. 509 *and in Journ. As. Soc.* 1877, pt. ii. 79. Ewyckia capitellata, *Walp. Rep.* v. 724; *Miq. Fl. Ind. Bat.* i. pt. i. 568. E. medinilliformis, *Naud. in Ann. Sc. Nat.* ser. 3. xviii. 261.

PINANG; *Jack, Wallich.* TENASSERIM; *Helfer* (Kew Distrib. No. 2279). MALACCA; *Maingay* No. 802. SINGAPORE; *Wallich.*

Leaves widest near the base; petiole less than $\frac{1}{4}$ in.—Doubtfully distinct from *P. cærulescens*: the leaves are usually much larger while the cymes are smaller.

3. **P. paniculata,** *Benth. in Wall. Cat.* 4080; leaves short-petioled normally elliptic or lanceolate, ends of the branches dividing into bundles of small-leaved branchlets on which are the scattered flowers. P. latifolia, *Triana in Trans. Linn. Soc.* xxviii. 153. Ewyckia latifolia, *Blume Mus. Bot.* i. 6.

PINANG; *Porter.* MALACCA; *Griffith* (Kew Distrib. No. 2273).—DISTRIB. Sarawak.

The normal leaves are about 5 by 2 in., the abnormal leaves on the "panicles" are very narrow lanceolate, often 1 by $\frac{1}{8}$–$\frac{1}{4}$ in.—This is probably only a proliferous state of *P. cærulescens* as Korthals and Miquel treat it.

20. KIBESSIA, *DC.*

Large shrubs, glabrous or minutely pubescent. *Leaves* opposite, short-petioled, ovate or oblong, entire, coriaceous, 3-nerved. *Flowers* axillary, long-peduncled, solitary or clustered, large (except in *K. tuberculata*); peduncles 1–3-flowered, pedicels 2-bracteolate in the middle. *Calyx-tube* campanulate or hemispheric, covered with elongated scales or simple tubercles; limb 4-lobed and persistent or calyptriform and deciduous. *Petals* 4, ovate or oblong. *Stamens* 8, equal, filaments short, subulate; anthers short, very thick, opening by slits, connective at the base naked or shortly spurred. *Ovary* inferior, 4-celled, apex glabrous depressed; style filiform, stigma clavate; ovules very many, placentas sub-basal. *Berry* subglobose, covered with scales or tubercles, or in *K. tuberculata* ultimately nearly smooth. *Seeds* cuneate-obovoid, angular.—DISTRIB. Species 14; confined to Malaya, from Pinang to Borneo.

1. **K. simplex,** *Korth. Verh. Nat. Gesch. Bot.* 253; leaves narrowed at the base, calyx-tube with oblong-linear scales those towards the top of the tube about ¼ in. persistent in the fruit, calyx-limb calyptriform, fruit ⅓ in. broad. *Blume Mus. Bot.* i. 9; *Triana in Trans. Linn. Soc.* xxviii. 152. K. cupularis, *Dcne. in Deless. Ic. Sel.* v. t. 5 *and in Ann. Sc. Nat.* ser. 3. v. 317. Pternandra echinata, *Jack in Mal. Misc.* ii. *Addenda prefixed to the paper* 3; *Wall. Cat.* 4078, *for the most part.*

PINANG and MALACCA; *Wallich, Griffith,* &c. SINGAPORE; *T. Anderson.*—DISTRIB. Borneo, Philippines.

Young *branches* obscurely quadrangular, rusty puberulous. *Leaves* 2–3 in., oblong or elliptic, acuminate, when young pubescent beneath, when mature glabrescent or with rusty pubescence on the nerves; petiole ⅛–¼ in. *Peduncles* 1- (less often 3-) flowered; bracts nearly ¼ in., oblong, persistent. Scales of the *calyx-tube* minutely rusty pubescent.

2. **K. pubescens,** *Dcne. in Ann. Sc. Nat.* ser. 3. v. 318; leaves oblong base somewhat rounded or subcordate, calyx-tube with triangular short subulate scales, those towards the top of the tube scarcely ⅛ in., limb 4-lobed persistent, fruit ⅓ in. broad. *Triana in Trans. Linn. Soc.* xxviii. 152. Pternandra echinata, *Wall. Cat.* 4078, *letter a only.*

PINANG, *Wallich.*

Young branches obscurely quadrangular, rusty puberulous. *Leaves* 2–3 in., oblong or elliptic, acuminate, when mature with minute rusty pubescence beneath, nerves with longer pubescence; petiole hardly ⅛ in. Scales of the *calyx-tube* minutely rusty-pubescent. Apex of the *ovary* in fruit concave, with 16 radiating lines.—Very near the preceding species.

3. **K. acuminata,** *Dcne. in Ann. Sc. Nat.* ser. 3. v. 316; leaves narrowed or rounded at the base nearly glabrous, calyx-tube with triangular scales those towards the top of the tube linear elongate, limb calyptriform acuminated into a linear point. *Triana in Trans. Linn. Soc.* xxviii. 153.

SINGAPORE; *Walker, Maingay* No. 804.

Young *branchlets* and *peduncles* minutely rusty pubescent. *Leaves* 2–3 in., oblong or elliptic, acuminate, when mature glabrous or scarcely rusty pubescent on the nerves beneath; petiole scarcely ⅛ in. *Bracts* of the buds ¼ in., ovate.

4. **K. tuberculata,** *Hook. f. in Gen. Pl.* i. 772; young calyx-tube covered with sessile flat tubercles, limb 4-toothed, fruit ovoid nearly glabrous finally. Rectomitra tuberculata, *Blume Mus. Bot.* i. 7; *Triana in Trans. Linn. Soc.* xxviii. 153. Ewyckia tuberculata, *Korth. Verh. Nat. Gesch. Bot.* 255; *Miq. Fl. Ind. Bat.* i. pt. i. 569.

MALACCA; *Maingay* No. 805.—DISTRIB. Sumatra.

Branchlets round, glabrous. *Leaves* 2–3 in., ovate or elliptic, shortly acuminate, glabrous; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Peduncles* glabrous, clustered, 3–5-flowered; bracts less than $\frac{1}{8}$ in. *Fruit* $\frac{1}{8}$–$\frac{1}{5}$ in. diam.

21. MEMECYLON, *Linn.*

Shrubs or *trees*, glabrous. *Leaves* opposite, short-petioled or sessile, coriaceous, orbicular ovate or lanceolate, entire, pinnate-nerved rarely 3-nerved. *Flowers* usually in small axillary rarely terminal simple or panicled cymes or umbels. *Calyx-tube* campanulate, glabrous; limb dilated, truncate or shortly 4-lobed. *Petals* 4, blue or white, rarely reddish. *Stamens* 8, equal, filaments long; anthers short, opening by slits in front, connective ending in a horn behind. *Ovary* inferior, 1-celled; apex glabrous surmounted by a convex or depressed disc with 8 radiating grooves; style filiform, simple; ovules 6–12 (in *M. Maingayi* 20 at least), whorled on a free central placenta. *Berry* globose or ellipsoid, crowned with the calyx-margin, 1-seeded. *Seed* large, cotyledons convolute.—DISTRIB. Species about 100 (but very difficult and many doubtful of determination) numerous in South-East Asia and its islands; a few extending into Polynesia and Australia, several in tropical Africa.

The following is merely an artificial key to the material at Kew: the species which appear tolerably distinct from *M. edule* are taken first; and the last group contains the enormous mass of specimens that appear difficult to separate from *M. edule.*

I. Leaves 3-nerved from the base.

1. **M. Arnottianum,** *Thwaites Enum.* 113; leaves long caudate-acuminate, apex obtuse, peduncle 1 in. very slender. *Triana in Trans. Linn. Soc.* xxviii. 159. Eugenia? capitellata, *Arn. Pugill.* 17.

CEYLON; "at no great elevation," *Thwaites, Walker.*

Shrub 10–12 ft.; branchlets slender, round. *Leaves* 2–2$\frac{1}{2}$ in., somewhat distichous, elliptic, suddenly acuminated, base roundish, punctate on both surfaces; petiole scarcely $\frac{1}{16}$ in. *Peduncles* solitary; flowers few, very small, sessile at their apex; petals white (*Thwaites*). *Berry* scarcely $\frac{1}{4}$ in. diam., globose, areola $\frac{1}{16}$ in. wide.—A variety communicated by Mr. Thwaites has the leaves much larger, 4$\frac{1}{2}$ in., the acuminated apex much shorter.

2. **M. Gardneri,** *Thwaites Enum.* 113; leaves acute scarcely acuminate, inflorescence clustered, peduncle 0–$\frac{1}{4}$ in. *Triana in Trans. Linn. Soc.* xxviii. 159.

CEYLON; alt. 2000–5000 ft.; *Thwaites.*

A small tree; ultimate branchlets quadrangular. *Leaves* broad-elliptic, narrowed at the base, opaque, pellucid-punctate; petiole $\frac{1}{8}$ in. *Flowers* white (*Thwaites*), very small; buds very acute. *Calyx-tube* at the time of flowering funnel-shaped, distinctly 4-toothed. *Berry* size of a pea, spherical, purple-black.

II. Leaves pinnate-nerved, often very opaque, midrib always conspicuous, nerves conspicuous or obscure.

* *Ultimate branchlets quadrangular (see also* No. 21, 22, 24, 37, 40).

† *Leaves usually more than 4 in. (nerves often distinct).*

3. **M. Wightii,** *Thwaites Enum.* 113; leaves 3–4½ in. subsessile elliptic-lanceolate base cordate, peduncle 0, pedicels clustered $\frac{1}{8}$–$\frac{1}{5}$ in., calyx-tube at the time of flowering subcampanulate.

WESTERN PENINSULA; Canara; *Ritchie.* CEYLON, alt. 3000–4000 ft., *Thwaites.*

A tree 25 ft.; ultimate branchlets stout, acutely quadrangular. Secondary nerves conspicuous, marginal looped nerve obscure. *Buds* obtuse, calyx-limb 4-dentate. *Petals* blue. *Berry* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., globose.—United by Triana with *M. amplexicaule* No. 24, which has round stems, much larger flowers, and the calyx-tube at the time of flowering saucer-shaped.

4. **M. Hookeri,** *Thwaites Enum.* 113; leaves 6–9 in. sessile oblong-lanceolate base cordate, peduncle 0, pedicels $\frac{1}{4}$ in. clustered, calyx-tube at the time of flowering saucer-shaped. *Triana in Trans. Linn. Soc.* xxviii. 158.

CEYLON; alt. 1000 ft.; *Thwaites.*

An erect shrub 8–12 ft., sparingly branched; ultimate branchlets stout, acutely quadrangular. *Leaves* very conspicuously nerved, secondary nerves running into a conspicuous marginal nerve. *Buds* obtuse, but apiculate; calyx-limb obscurely 4-lobed. *Petals* blue. *Berry* $\frac{1}{3}$ in. diam., spherical, finally black-purple.—Thwaites has sent (under No. 2686*) examples marked "*M. Hookeri,* variety with exalate branchlets, sessile flowers." These examples have perfectly round branchlets and seem in all respects identical with No. 25 *M. macrophyllum,* Thwaites.

5. **M. Griffithianum,** *Naud. in Ann. Sc. Nat.* ser. 3. xviii. 274; leaves 5–7 by 1–1½ in. nearly sessile linear-lanceolate rounded or somewhat acute at the base, peduncle 0, pedicels $\frac{1}{8}$–$\frac{1}{5}$ in. clustered. *Triana in Trans. Linn. Soc.* xxviii. 158, *not of Kurz, in For. Fl.* i. 515. M. cæruleum, *var.* 3 Griffithianum, *Kurz, For. Fl.* i. 511.

MERGUI; *Griffith* (No. 2323 Kew Distrib.).

Ultimate branchlets 4-winged. *Leaves* somewhat opaque, secondary nerves visible, marginal quite obscure; petiole 0–$\frac{1}{8}$ in. *Flowers* rather large, pale blue (Griffith); buds obtuse. *Calyx-tube* at the time of flowering funnel-shaped, limb nearly truncate. *Disc* depressed, conspicuously rayed.—*M. Horsfieldii,* Miquel, said by Kurz (*Journ. As. Soc.* 1876, pt. ii. 54) to be a synonym of *M. Griffithianum,* widely differs; of *M. Campongum,* Miquel, also given as a synonym by Kurz, no authentic specimen exists at Kew. In *Journ. As. Soc.* 1877, pt. ii. 82, and *For. Fl.* i. 515, Kurz quotes for *M. Griffithianum* Helfer's No. 2331, from which it is clear that he refers to No. 20 *M. grande,* Retz, var. *merguica.*

6. **M. elegans,** *Kurz in Journ. As. Soc.* 1872, pt. ii. 307, *For. Fl.* i. 514; leaves 3–4 in. elliptic obtuse narrowed at the base, petiole $\frac{1}{8}$–$\frac{1}{5}$ in., peduncles $\frac{1}{2}$ in. 3 or 4 together carrying mostly simple umbels, pedicels $\frac{1}{8}$ in.

SOUTH ANDAMAN ISLAND; *Kurz.*

A shrub; ultimate branchlets distinctly quadrangular. *Leaves* with the secondary nerves visible, marginal quite obscure. *Peduncles* quadrangular. *Flowers* blue (Kurz). *Calyx-tube* somewhat large, at the time of flowering saucer-shaped; disc on the apex of the ovary depressed, prominently rayed.

VAR. *dichotoma;* leaves 3–4 in. subsessile ovate-elliptic acute or shortly acuminate, cymes very short, peduncle 0–$\frac{1}{8}$ in., pedicels $\frac{1}{8}$–$\frac{1}{5}$ in. Malacca, *Griffith* (No. 2324 Kew Distrib.); Mount Ophir, *Maingay* No. 818, 820. *Branchlets* somewhat flattened, repeatedly forked, ultimate quadrangular, at least under the nodes. *Leaves* at the base rounded or acute but not at all acuminate, secondary nerves conspicuous,

marginal obscure; petiole sometimes manifest, attaining $\frac{1}{16}$ in. *Flowers* blue, somewhat large, buds obtuse. *Calyx-tube* truncate even in the bud. *Disc* depressed, distinctly rayed. *Berry* $\frac{1}{4}$ in. diam., spherical, areola very small, about $\frac{1}{16}$ in. wide.

†† *Leaves rarely attaining* 4 *in., usually opaque, nerves obscure.*

7. **M. amabile,** *Bedd. Ic. Pl. Ind. Or.* t. 163; leaves $1\frac{1}{2}$–$2\frac{1}{4}$ in. nearly sessile oblong-lanceolate opaque, base cordate, peduncles $\frac{1}{2}$–$\frac{3}{4}$ in. 1–3 together axillary and terminal, pedicels $\frac{1}{5}$ in.

SOUTH CANARA GHATS, up to 2000 ft.; *Beddome.*

Cymes small, simple on each peduncle or compound but close. *Calyx-tube* funnel-shaped at the time of flowering, limb truncate; buds obtuse. *Petals* blue. *Disc* plane (Beddome).—Very probably a form of *M. terminale* No. 22 with quadrangular branchlets; but the peduncles are rather shorter, and the flowers smaller.

VAR. *malaccensis*; leaves $1\frac{1}{2}$–$2\frac{1}{4}$ in. oblong acuminate base rounded very opaque coriaceous, peduncles $\frac{1}{5}$ in. clustered axillary and terminal, cymes simple, pedicels less than $\frac{1}{5}$ in.—Malacca, *Maingay* No. 819.—Branchlets quadrangular, 4-winged below the nodes. *Petiole* $\frac{1}{16}$ in. *Buds* acute, not large. *Calyx-tube* saucer-shaped at the time of flowering; limb in the bud nearly truncate. *Disc* depressed, obscurely rayed. —This is perhaps really allied to *M. pauciflorum* No. 10, but the leaves differ materially in their rounded base and acuminate apex.

8. **M. elegantulum,** *Thwaites Enum.* 112; leaves 3 in. narrow-lanceolate long acuminate apex obtuse, panicles filiform somewhat elongate few-flowered, pedicels subsolitary one half longer than the calyx. *Triana in Trans. Linn. Soc.* xxviii. 159.

CEYLON; Saffragam district at no great elevation; *Thwaites.*

Leaves acute at the base, nerves obscure; petiole $\frac{1}{8}$ in. *Flowers* white. *Berry* spherical, the size of a pea.

9. **M. gracile,** *Bedd. Ic. Pl. Ind. Or.* t. 164; leaves 1–$1\frac{1}{2}$ in. elliptic-lanceolate acuminate apex obtuse, peduncles solitary $\frac{1}{4}$ in. 3-flowered, pedicels $\frac{1}{8}$ in.

TRAVANCORE and TINNEVELLY GHATS; *Col. Beddome.*

A small tree or large shrub; branchlets slender, distinctly quadrangular. *Leaves* opaque, nerves very obscure; petiole $\frac{1}{16}$–$\frac{1}{8}$ in. *Petals* pale blue. *Disc* distinctly rayed.—Beddome describes the pedicels as 2–3 in. long, probably a misprint for 2–3 lines.

10. **M. pauciflorum,** *Blume Mus. Bot.* i. 356; leaves $\frac{1}{2}$–$1\frac{1}{2}$ in. subsessile rhomboid oblong or elliptic obtuse or acute but not acuminate opaque acute at the base, peduncles scarcely any, pedicels less than $\frac{1}{4}$ in. *Miq. Fl. Ind. Bat.* i. pt. i. 578; *Triana in Trans. Linn. Soc.* xxviii. 158; *Kurz For. Fl.* i. 514. M. australe, *F. Muell. ex Triana in Trans. Linn. Soc.* xxviii. 159. M. umbellatum, *Benth. Fl. Austral.* iii. 293, *not of others.*

CHITTAGONG; *H. f. & T.* MERGUI; *Griffith*; TENASSERIM, *Helfer* (Kew Distrib. No. 2332). ANDAMANS; *Kurz.* SINGAPORE; *Lobb.*—DISTRIB. Through Malaya to North Australia.

A tree 20–25 ft. high. *Flowers* minute, whitish (Kurz). *Calyx* at the time of flowering saucer-shaped. *Disc* distinctly rayed. *Buds* very acute or rostrate. *Berry* $\frac{1}{5}$ in. diam., spherical, areola scarcely $\frac{1}{16}$ in. wide; pedicel $\frac{1}{4}$–$\frac{3}{8}$ in.—Miquel, (*Fl. Ind. Bat.* i. pt. i. p. 578) says that *M. pauciflorum* is hardly more than a form of *M. myrsinoides* Blume; and Blume's authentic specimens hardly differ except

by the leaves being considerably larger. Triana in Kew Herb. has referred a totally different plant to *M. myrsinoides*, viz. *Wall. Cat.* 4019 (*M. umbellatum, Wall.*), which has round stems, petioled leaves, buds not rostrate, and is *M. edule* or very near thereto.

11. **M. ellipticum,** *Thwaites Enum.* 112; petiole 0–$\frac{1}{16}$ in. but often distinct, leaves 2$\frac{1}{4}$ in. broad-elliptic obtuse or shortly acuminate apex obtuse, base round or acute not acuminated, peduncles clustered 0–$\frac{1}{8}$ in., pedicels attaining $\frac{1}{5}$ in. *Triana in Trans. Linn. Soc.* xxviii. 159.

Ceylon; between Galle and Ratnapoora at no great elevation; *Thwaites, Walker, Gardner.*

A small tree. *Calyx* at time of flowering saucer-shaped, small. *Flowers* white. Nerves of the *leaves* obscure, but the marginal ones visible.—Mr. Thwaites appears to have issued his No. 1557 without name: it seems the same as 3479, and has small globose berries about $\frac{1}{5}$ in. diam., the areola scarcely $\frac{1}{16}$ in. wide.

12. **M. varians,** *Thwaites Enum.* 112; leaves $\frac{1}{2}$–1$\frac{1}{2}$ in. oblong acute or obovate rhomboid or elliptic obtuse always narrowed at the base, nerves very obscure, petiole 0–$\frac{1}{8}$ in., inflorescence densely clustered hardly extending $\frac{1}{2}$ in. from the stem, buds obtuse, calyx-tube at the time of flowering saucer-shaped, disc very obscurely rayed. *Triana in Trans. Linn. Soc.* xxviii. 159. M. parvifolium, *Thwaites Enum.* 113; *Triana l. c.*

Ceylon; alt. 2000–7000 ft., *Thwaites.*

A small tree. *Petals* white or blue. *Berry* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., spherical, shortly pedicelled, areola $\frac{1}{12}$ in. diam., prominent.—Thwaites says that his *M. parvifolium* is possibly a variety of his *M. varians* but that the leaves are cuneate at the base and a good deal smaller; but in 2927 (marked *M. varians*) the leaves are smaller than in most of his *M. parvifolium* and very cuneate at base. This species is very near *M. ellipticum* Thwaites, but differs by its leaves not acuminated. It is also very near *M. pauciflorum* (No. 10) which differs in its rostrate buds and strongly radiate disc. Lastly the branchlets are sometimes nearly round and then it has been named *M. capitellatum* or *M. edule.*

** *Ultimate branchlets round.*

† *Berry large,* $\frac{1}{3}$ *in. diam. or more.*

13. **M. procerum,** *Thwaites Enum.* 415; leaves 6–10 in. elliptic acuminate subacute at the base, petiole $\frac{1}{5}$–$\frac{1}{2}$ in., berry $\frac{3}{8}$–$\frac{1}{2}$ in. diam. subsessile areola prominent $\frac{1}{5}$ in. wide. *Triana in Trans. Linn. Soc.* xxviii. 158.

Ceylon; Pasdoon and Hinidoon Corle, *Thwaites.*

A tree 30–40 ft. high. *Leaves* thick, but both the secondary and looped marginal nerves can be seen, much paler beneath; petiole grooved on the upper surface. *Calyx* $\frac{1}{6}$ in. broad (in flower?).

14. **M. ovoideum,** *Thwaites Enum.* 112; leaves 3 in. round-elliptic base cordate sessile or exceedingly shortly suddenly narrowed into a minute petiole, peduncle 0, pedicels very short clustered. *Triana in Trans. Linn. Soc.* xxviii. 159. M. macrocarpum, *Thwaites Enum.* 110.

Ceylon; alt. 4000–5000 ft., near Adam's Peak; *Thwaites.*

A small tree; branchlets thick. *Leaves* very thick, coriaceous, nerves obscure. *Berry* $\frac{1}{2}$ in. diam., areola raised on a cylindric neck, disc within the mouth elevated and strongly rayed in the ripe fruit.—Thwaites *ovoideum* No. 2622, among other things differs in the mouth of the fruit which is depressed not radiate and is to be referred to *M. revolutum* No. 27.

15. **M. heteropleurum,** *Blume Mus. Bot.* i. 362; leaves 4–6 in. nearly sessile narrowly elliptic acuminate nerves distinct, inflorescence close axillary, buds obtuse, flowers large. *Miq. Fl. Ind. Bat.* i. pt. i. 579; *Triana in Trans. Linn. Soc.* xxviii. 157.

BURMA and MALAY PENINSULA; *Griffith* (No. 2337 Kew Distrib.). MALACCA; *Maingay* No. 816. SINGAPORE; *Maingay* No. 815.—DISTRIB. Sumatra and Java.

Leaves acute, but not at all acuminate at the base; both the secondary and marginal nerves prominent. *Calyx-tube* saucer-shaped at the time of flowering, limb truncate even in the bud. *Disc* flat, prominently rayed, *Berry* ⅓ in. diam. or more, areola ⅛ in. wide, somewhat prominent, disc much depressed.

16. **M. cerasiforme,** *Kurz, For. Fl.* i. 516; leaves 3–4 in. elliptic acuminate at both ends coriaceous, berries in short cymes ½ in. diam. very succulent.

CHITTAGONG; *Kurz.*

Leaves dried olive-yellow, lateral nerves obscure; petiole ⅕ in. *Flowers* not seen. *Peduncles* (of the fruits) ⅓ in., pedicels ⅛ in. *Berries* blue-black unusually succulent.

17. **M. Maingayi,** *C. B. Clarke*; leaves 8 in. subsessile oblong-lanceolate rounded or subcordate at the base secondary and marginal nerves prominent, cymes clustered axillary, peduncles and pedicels about ⅛ in. stout, flowers very large, buds obtuse, calyx-tube at the time of flowering campanulate limb truncate disc somewhat convex very prominently rayed.

MALACCA; *Maingay* No. 814.

The finest species of the genus, the flowers being far larger than in any other species, the calyx-tube in bud nearly ¼ in. wide. Maingay's example does not show fruit, but from the size of the flower it may be presumed that it would be large.

18. **M. microstomum,** *C. B. Clarke*; leaves 5 in. sessile ovate or oblong subobtuse cordate at the base opaque, flowers small densely clustered axillary, berry nearly ½ in. diam., calyx-limb 0, areola scarcely $\frac{1}{20}$ in. diam.

MALACCA; Keddah Peak, *Maingay* No. 821. ? MALAY PENINSULA, *Col. Low.*

A small tree (Maingay). *Leaves* thick, subamplexicaul, marginal nerves obscure, secondary visible. *Pedicels* less than ⅕ in., slender. *Buds* obtuse; *calyx*-tube funnel-shaped at the time of flowering, rays of the disc very obscure.

†† *Berry less than ⅓ in. diam. Inflorescence* 2 *in. or more, except in M. merguicum and M. grande.*

19. **M. Amherstianum,** *C. B. Clarke*; leaves 2–3 in. oblong acute very thick nerveless, petiole ⅛ in., panicle large terminal. *Wall. Cat.* 9127.

AMHERST; *Wallich.*

Flowers in close umbels at the summits of the ultimate branches of the panicle.—Differs from *M. paniculatum, Jack*, in the much smaller and thicker leaves.

20. **M. grande,** *Retz Obs.* iv. 26; leaves 3–5 in. elliptic or somewhat ovate acuminate narrowed but not at all acuminate at the base, petiole ⅕ in., peduncles ½–1 in. solitary or 2–3 together thick, berry nearly ¼ in. wide areola $\frac{1}{12}$ in. wide. *Wall. Cat.* 4103; *Triana in Trans. Linn. Soc.* xxviii. 158. M. laxiflorum, *Wall. Cat.* 4472. M. edule var. β, *Thwaites Enum.* 110. M. ambiguum, *Blume Mus. Bot.* i. 359; *Triana l.c.*

CEYLON; Thwaites, No. 3442. SINGAPORE; *Wallich.*—DISTRIB. Java.

Nerves of the *leaves* subprominent, marginal more obscure, apex obtuse often out of one plane so that in drying it is either broken off or crumpled and turned on one side. Branches of the *cyme* glabrous. *Buds* obtuse, not large. *Calyx-tube* at the time of flowering saucer-shaped, limb truncate. *Disc* scarcely depressed, rays prominent.—As regards the *name* of this species, that of Retz is cited by Triana, and his description suits the species, but will also suit several others. As regards the plant itself, the flowers and fruit are identical with *M. edule var. ovatum*; but the leaves are rather larger and the inflorescence rather more effuse. Thwaites is very likely right in regarding it as a variety of *M. edule.*

VAR. 1. *Horsfieldii*, Miq. Fl. Ind. Bat. i. 572 (sp.); nerves less prominent, inflorescence shorter, buds acute. M. celastrinum, *Kurz For. Fl.* i. 515.—Pegu, *Kurz.* Malacca; *Maingay* No. 811.

VAR. 2. *pubescens*; leaves 3–4½ in. glabrous elliptic suddenly acuminate, cymes proliferously umbellate, branches distinctly rusty-pubescent.—Malacca; *Griffith* (Kew Distrib. No. 2336). Branchlets round. *Leaves* acute, hardly acuminate at the base, secondary and marginal nerves somewhat prominent; petiole $\frac{1}{5}$ in. *Inflorescence* in young flower 2 in. *Calyx* (in flower time) very small, shallow, saucer-shaped. *Disc* rayed. *Fruit* not seen.—This variety is marked by Triana, *M. ambiguum* Bl. ?.

VAR. 3. *khasiana*; leaves 3–4 in. elliptic acuminate at both ends, apex acute, petiole $\frac{1}{5}$ in., fruit in a lax panicle extending 2–3 in., berry ¼ in. wide areola somewhat prominent $\frac{1}{12}$ in. wide.—Khasia Mts.; *Griffith* (No. 2333 Kew Distrib.). *Leaves* dried yellow, not very thick but rather opaque, nerves evident, marginal obscure. *Peduncle* in fruit 1–1½ in., pedicels often ½ in. The remains of the *disc* in the mouth of the fruit show that it was in flower prominently rayed.—Very near var. *Horsfieldii* but has the leaves more acuminate at both ends.

VAR. 4. *merguica*; leaves 4–6 in. elliptic and broad-elliptic obtuse narrowed gradually to the base subepetiolate, nerves somewhat distinct, peduncles solitary or clustered ½–¾ in., cymes compound. M. Griffithianum, *Kurz in Journ. As. Soc.* 1877, pt. ii. 82, *not of Naud.*—Mergui; *Griffith.* Tenasserim or Andamans; *Helfer* (No. 2331 Kew Distrib.). *Leaves* (in all the examples) with scattered glands on the lower surface. *Calyx-tube* at the time of flowering saucer-shaped or almost funnel-shaped, limb subtruncate. *Buds* medium-sized, obtuse; disc on the apex of the ovary rayed prominently. *Fruit* ¼ in. diam., areola $\frac{1}{12}$ in. wide.

21. **M. costatum,** *Miq. in Blume Mus. Bot.* i. 360; leaves 5-8 in. subsessile oblong-lanceolate cordate at the base secondary nerves strongly impressed, thyrsiform, Miquel, peduncles and pedicels exceedingly thick. *Miq. Fl. Ind. Bat.* i. pt. i. 573; *Triana in Trans. Linn. Soc.* xxviii. 157. M. grande, *Blume Bijd.* 1095; *Wall. Cat.* 4101.

MALACCA; *Maingay* No. 813.—DISTRIB. Java, Sumatra, Borneo.

A small tree; branchlets round but with four short acute wings at the base of the leaves. *Calyx-tube* at the time of flowering campanulate, limb truncate. *Disc* depressed, rays prominent. *Berry* ¾ in., ellipsoid, longer than broad; areola prominent, more than $\frac{1}{12}$ in. wide.—A species well marked by the prominent short wings on the branchlets at the base of the very short petiole.

††† *Berry less than* ⅓ *in. diam. Inflorescence less than* 2 *in. Leaves cordate at the base, sessile or very shortly petioled.*

22. **M. terminale,** *Dalz. in Hook. Kew Journ.* iii. 121; leaves 1½–2½ in. lanceolate acute opaque, peduncles ½–1½ in. slender 1–3 from the same axil axillary and terminal, pedicels umbelled. *Triana in Trans. Linn. Soc.* xxviii. 158; *Dalz. & Gibs. Bomb. Fl.* 93.

Southern Ghats of the DECCAN PENINSULA; CANARA; *Gibson, Dalzell.*

A shrub 2–3 ft. (Dalzell). *Calyx-tube* at the time of flowering saucer-shaped, limb truncate. *Buds* not large nor acute. *Disc* depressed, rays obscure. *Berry* ⅓ in. wide, ovoid, subglobose (broader than long), areola ⅛ in. wide.—This species has the branchlets with 4 lines and sometimes almost quadrangular: it is probably not distinct from *M. amabile* No. 7.

23. **M. cæruleum,** *Jack in Mal. Misc.* i. 26 (*not of Guill. & Perr.*); leaves 4–6 in. ovate or oblong acute not acuminate, berry ⅓ in. ellipsoid much longer than broad areola prominent ⅙ in. broad. *Miq. Fl. Ind. Bat.* i. pt. i. 580; *Triana in Trans. Linn. Soc.* xxviii. 158; *Kurz For. Fl.* i. 511. M. cordatum, *Wall. Cat.* 4100, *partly*; *Griff. Notul.* iv. 673. M. manillanum, *Naud. in Ann. Sc. Nat.* ser. 3. xviii. 276; *Miq. l. c.* 576. M. lutescens, *Presl Epim. Bot.* 208, *not of Naud.*

Southern MALAY PENINSULA with its islands, plentiful.—DISTRIB. Philippines.

Shrub 10 or 12 ft. *Leaves* opaque, sessile, rounded at the base, secondary and marginal nerves inconspicuous. *Peduncles* clustered, thick; inflorescence 1–1¼ in. *Calyx-tube* at the time of flowering funnel-shaped; buds obtuse. *Flowers* somewhat large, intense blue. *Disc* much depressed, rays obscure.—Widely cultivated in Bengal, &c., for the sake of its bright blue flowers. The branchlets are round as Jack states and not quadrangular as Presl states: but there is no doubt as to Presl's plant as he describes from Cumming's No. 2322 which is *M. cæruleum.* Of Kurz's *M. cæruleum*, var. 2. *floribundum*, I know nothing.

VAR. *pulchrum*, Kurz For. Fl. i. 510 (sp.); peduncles and pedicels more slender. —Andamans, *Kurz.* Kurz's specimens have the inflorescence hardly more slender than in *M. cæruleum.* Kurz appears to have abandoned the distinction he founded on the less ellipsoid berry.

24. **M. amplexicaule,** *Roxb. Fl. Ind.* ii. 260; leaves 2–6 in. elliptic or oblong amplexicaul, peduncle 0, pedicels less than ¼ in. slender clustered, berry ⅓ in. globose or subovoid, areola ⅛ in. broad somewhat prominent. *Wight Ic.* t. 279; *W. & A. Prodr.* 320; *Naud. in Ann. Sc. Nat.* ser. 3. xviii. 277; *Miq. Fl. Ind. Bat.* i. pt. i. 580. M. depressum, *Benth. in Wall. Cat.* 4101; *Triana in Trans. Linn. Soc.* xxviii. 158. M. sessile, *Wall. Cat.* 4112. M. cordatum, *Wall. Cat.* 4100 *partly.*

PINANG *Roxburgh, Wallich.*

Leaves sometimes acuminated, secondary nerves prominent. *Buds* small, obtuse. *Flowers* pale yellowish-blue. *Disc* depressed, rays obscure. *Berry* not longer than broad.—This (and not *M. cæruleum*, as Triana says) is certainly Roxburgh's *M. amplexicaule*, for, besides other reasons, Roxburgh's figure, preserved at Kew, has yellow flowers.

VAR. 1. *malabarica*; leaves often not exceeding 2–3 in., sometimes distinctly petioled, never acuminate, secondary nerves obscure.—Nilghiris, Mts. of Kurg, &c., plentiful. Not from Ceylon, for Thwaites, No. 2570 cited by Triana is *M. Wightii*, No. 3.

VAR. 2. *cordata*, Wight mss.; branchlets distinctly quadrangular.—This seems not remote from No. 7 *amabile.*

25. **M. macrophyllum,** *Thwaites Enum.* 111; leaves 6–12 in. oblong-lanceolate, peduncles 0, pedicels short, berry ⅓ in. diam. spherical. *Triana in Trans. Linn. Soc.* xxviii. 158.

CEYLON; alt. 1000–3000 ft., *Thwaites.*

Leaves with the nerves little impressed but both the secondary and marginal

are visible. *Petals* pale blue (Thwaites).—Neither Mr. Thwaites' examples nor his description show this species to differ from *M. amplexicaule* except by the leaves being larger (see No. 4. *M. Hookeri*).

26. **M. orbiculare,** *Thwaites Enum.* 112; leaves 1½ in. diam. orbicular very thick and opaque, pedicels less than ¼ in. clustered. *Triana in Trans. Linn. Soc.* xxviii. 158.

CEYLON; alt. 1000 ft., Hinidoon Corle; *Thwaites.*
A small tree. *Buds* small, obtuse. *Calyx-tube* at the time of flowering saucer-shaped. *Petals* blue. *Disc* obscurely rayed.

27. **M. revolutum,** *Thwaites Enum.* 111; leaves 3 in. round-elliptic coriaceous nerves impressed, peduncles clustered rather stout in fruit ¾ in., berry ½ in. diam. spherical mouth less than ⅛ in. wide. *Triana in Trans. Linn. Soc.* xxviii. 159.

CEYLON; alt. 5000 ft., Rambodde; *Thwaites.*
A small tree. *Flowers* small, white. *Berry* black-purple. Whole inflorescence not exceeding 1 in. in the fruiting example communicated by Mr. Thwaites, but Mr. Thwaites' picture shows it 2 in. very dense and compound in flower.

28. **M. deccanense,** *C. B. Clarke*; leaves 4–5 in. narrowly oblong-lanceolate, peduncle 0, pedicels clustered less than ¼ in., flowers small. M. Heyneanum, *Wight Ic.* t. 278 ?. M. Wightianum, *Triana in Trans. Linn. Soc.* xxviii. 158 (*not* M. Wightii, *Thwaites*).

DECCAN PENINSULA; *Wight.*
Branches with 4 lines, ultimate branches terete. *Leaves* rounded and almost cordate at the base, opaque, thin, secondary nerves not prominent; petiole ⅛ in.—Separated by Triana from *M. Heyneanum* from which it considerably differs. As to *Wight Ic.* t. 278 it exhibits exactly the leaves of the present species, but the inflorescence appears rather to belong to the next.

†††† *Berry less than ⅓ in. diam. Inflorescence less than 2 in. Leaves 4–6 in., long-petioled, narrow-lanceolate, acuminate at the base.*

29. **M. Heyneanum,** *Benth. in Wall. Cat.* 4102; leaves 4–7 in. lanceolate elongate nerves impressed narrowed into the petiole ¼ in., inflorescence less than 1 in., peduncles usually short, buds large acute. *W. & A. Prodr.* 319; *Triana in Trans. Linn. Soc.* xxviii. 158. M. jambosoides, *Wight Ic.* t. 277; *Thwaites Enum.* 112; *Miq. Fl. Ind. Bat.* i. pt. i. 580.

DECCAN PENINSULA; Courtallum &c. *Wight.* CEYLON; up to 3000 ft., *Thwaites.*
Calyx-tube at the time of flowering broadly funnel-shaped, limb truncate. *Disc* obscurely rayed. *Berries* less than ¼ in. diam., spherical, nearly sessile.—The typical *M. Heyneanum* Benth. is a well marked and easily recognised plant: but the two varieties of Mr. Thwaites could never have been referred to it in the herbarium. Mr. Thwaites says the berry is as much as ⅓ in. diam. in the Ceylon plants, but his specimens at Kew do not show fruit.
VAR. 1. *latifolia*; leaves broader a fresh green colour narrowed almost to the base so that there is scarcely any true petiole, nerves visible but slender and hardly at all impressed.—Thwaites No. 2468.
VAR. 2. *angustifolia*; leaves linear-lanceolate when dry orange yellow thick and opaque.—Thwaites No. 1555.

††††† *Berry less than $\frac{1}{3}$ in. diam. Inflorescence less than 2 in. Leaves usually less than 4 in., distinctly acuminate, often rostrate, base not cordate, petiole short.* (See also *M. grande* above). N.B. This series only differs from the *M. edule* series by the more distinct acumination of the leaves.

30. **M. lævigatum,** *Blume Mus. Bot.* i. 358; leaves 2–3 in. broad-elliptic suddenly shortly acuminate at both ends, petiole $\frac{1}{8}$–$\frac{1}{4}$ in., peduncles clustered 0–$\frac{1}{4}$ in., inflorescence not $\frac{3}{4}$ in., buds large very acute. *Miq. Fl. Ind. Bat.* i. 576; *Triana in Trans. Linn. Soc.* xxviii. 157; *Kurz For. Fl.* i. 513. M. Myrtilli, *Blume l. c.* 357; *Miq. Fl. Ind. Bat.* i. 578. M. pachyderma, *Wall. Cat.* 4104. M. Vosmaerianum, *Scheffer in Flora* 1870, 249.

TAVOY; *Wallich.* TENASSERIM and ANDAMANS; *Helfer* (Kew Distrib. No. 2328). MALACCA; *Maingay* No. 817.—DISTRIB. Java, Sumatra, Borneo.

Branchlets round (Blume says subquadrangular in *M. lævigatum,* terete in *M. Myrtillus*; but they seem all the same and never distinctly quadrangular). *Leaves* somewhat thin but opaque, nerves obscure but can be seen. *Peduncles* occasionally terminal as well as axillary. *Calyx-tube* at the time of flowering more than $\frac{1}{6}$ in., wide, saucer-shaped. *Disc* on the apex of the ovary obscurely rayed. *Berry* $\frac{1}{4}$ in. diam., globose, subsessile, mouth small.

VAR. *sylvaticum,* Thwaites Enum. 110 (sp.); petiole somewhat shorter, leaf long decurrent (but in Thwaites' example No. 1567 the leaves are petioled exactly as in *M. sylvaticum*).—Ceylon; alt. 2000–4000 ft.; common, Thwaites. As Mr. Thwaites remarks, some of his examples of *M. sylvaticum* are very near *M. edule*; they differ by the more acuminate leaves and the larger, sharply acute buds. Triana in Herb. inquires how the two differ.

31. **M. intermedium,** *Blume Mus. Bot.* i. 358; leaves 2–4 in. oblong-lanceolate acuminate at each end somewhat rostrate with the apex obtuse, petiole $\frac{1}{8}$–$\frac{1}{4}$ in., peduncles solitary axillary $\frac{1}{4}$–$\frac{3}{4}$ in., pedicels few $\frac{1}{8}$–$\frac{1}{4}$ in., buds somewhat large acute. M. umbellatum, *Blume Bijd.* 1094; *Naud. in Ann. Sc. Nat.* ser. 3. xviii. 273; *Triana in Trans. Linn. Soc.* xxviii. 157. M. garcinioides β. elongatum, *Blume Mus. Bot.* i. 358.

TENASSERIM or ANDAMANS; *Helfer* (Kew Distrib. No. 2335).—DISTRIB. Sumatra, Java.

Leaves somewhat thin, nerves all slender but visible. *Calyx-tube* at the time of flowering saucer-shaped. *Disc* on the apex of the ovary obscurely rayed.—This species is exceedingly near *M. lævigatum*; the leaves are narrower with a longer acumination; the simple umbels at the summit of manifest peduncles give a slightly different look to the inflorescence.

32. **M. plebejum,** *Kurz For. Fl.* i. 513; leaves $2\frac{1}{2}$–$3\frac{1}{2}$ in. elliptic-lanceolate acuminate acute at the base, petiole $\frac{1}{8}$–$\frac{1}{5}$ in., cymes lateral short, otherwise like *M. edule.*

PEGU; *Kurz.*

Leaves opaque, nerves scarcely visible, marginal quite obscure.—Kurz' example communicated exhibits neither flower nor fruit, so there must be doubt whether the subjoined var. belongs.

VAR. *silhetense*: peduncles 0–$\frac{1}{8}$ in. clustered, inflorescence extending hardly $\frac{1}{2}$ in., calyx-tube at the time of flowering saucer-shaped or somewhat funnel-shaped small, disc on the apex of the ovary prominently rayed. Chattuck, in the plain of Sylhet. *H. f. & T.*—Leaves exactly those of *M. plebejum Kurz.* Marked *M. lævigatum Blume?* by Triana, but the inflorescence as well as the leaves must be nearer *M. plebejum*, unless all are referable to one species.

33. **M. acuminatum,** *Smith ex Triana in Trans. Linn. Soc.* xxviii. 158; leaves 2–2½ in. broad-elliptic acuminated at both ends apex long rostrate obtuse, petiole ⅛–⅕ in., peduncles solitary (or 2 together) ¼–¾ in., cyme somewhat lax compound, buds very acute not large.

MALACCA; *Griffith* (Kew Distrib. No. 2325–1).

Leaves nearly concolorous, opaque. *Peduncles* sometimes terminal as well as axillary. *Disc* on the apex of the ovary distinctly rayed.—This can hardly be more than a variety of *M. lævigatum*; it differs by its decisively rostrate leaves and smaller flowers. Memecylon *Maingay* No. 810 (from Malacca) slightly differs by having the leaves much lighter coloured on the lower surface and shortly rostrate, the peduncles shorter, and is still nearer *M. lævigatum*.

VAR. *flavescens*; leaves 2½–3 in. elliptic acuminate at both ends apex rostrate obtuse secondary and marginal nerves distinct, petiole ⅛–⅕ in., inflorescence extending ½–¾ in., peduncles clustered about ⅛ in., cyme-branches repeatedly shortly divided, flowers very small. Malacca; *Griffith* No. 2325–2.—*Leaves* concolorous, greenish yellow in the dried examples. Branches of the *cyme* minutely scabrous almost puberulous. *Calyx-tube* at the time of flowering saucer-shaped, limb truncate. *Disc* on the apex of the ovary distinctly rayed.—Marked as "nov. sp." by Triana.

34. **M. fuscescens,** *Thwaites Enum.* 111; leaves 2–2½ in. nearly sessile elliptic acuminate rostrate base acute, nerves slender but visible, inflorescence extending less than ½ in. *Triana in Trans. Linn. Soc.* xxviii. 159.

CEYLON; Kokool Corle, at no great elevation; *Thwaites* No. 2926, 287.

Berry ⅓ in. diam., spherical, ex Thwaites.—Mr. Thwaites in a note on No. 2926 doubts if it is really distinct from *M. lævigatum* var. *sylvaticum* (No. 36 above).

35. **M. rostratum,** *Thwaites Enum.* 111; leaves 1½–2 in. elliptic acuminate rostrate apex obtuse base attenuate opaque coriaceous, inflorescence extending less than ½ in. *Triana in Trans. Linn. Soc.* xxviii. 159.

CEYLON; Central Province, alt. 3000–4000 ft., *Gardner, Thwaites.*

A small tree. *Petals* white. *Berry* ⅕ in. diam., spherical, mouth scarcely $\frac{1}{16}$ in. wide.

36. **M. rhinophyllum,** *Thwaites Enum.* 110; leaves 2–3 in. subsessile elliptic acuminate apex obtuse base acute opaque nerves very obscure, inflorescence extending less than ¾ in. *Triana in Trans. Linn. Soc.* xxviii. 159.

CEYLON; Central Province up to 3000 ft.; *Walker, Thwaites,* No. 2928, 2572.

A small tree. *Peduncles* about ⅛ in., clustered; cymes small, somewhat dense; buds small, not acute *Flowers* pale blue. *Berry* ¼ in. diam., black-purple, spherical.—Differs from the last species by its leaves sessile not acuminate at the base. These three Ceylon species (41, 42, 43) seem very close together, but Mr. Thwaites, who knows them alive, keeps them separate. But they are not so near together as the Malayan species of Blume in this same series. In this (as in so many other cases) there are only two courses open in order to represent all the material, viz., either a large grouping of existing species or the founding of a number of new ones on very slender grounds.

†††††† *Berry less than ⅓ in. diam. Inflorescence less than 2 in. Leaves usually less than 4 in., not acuminate though often acute, base not cordate.*

37. **M. angustifolium,** *Wight Ic.* t. 276; leaves 2 in. opaque very narrow-oblong obtuse base attenuate, petiole ⅕ in. *Thwaites Enum.* 111; *Triana in Trans. Linn. Soc.* xxviii. 158.

DECCAN PENINSULA; *Wight*, No. 1069. CEYLON; up to 2000 ft. alt.; *Thwaites.*
Shrub 6-8 ft. high. *Inflorescence* dense, extending hardly $\frac{3}{4}$ in.; peduncles usually $\frac{1}{8}$-$\frac{1}{5}$ in., clustered. *Flowers* blue, as of *M. edule. Calyx-tube* at the time of flowering saucer-shaped, limb truncate. *Disc* on the apex of the ovary depressed, very obscurely rayed. *Berry* size of a pea, black-purple. (Thwaites.)

VAR. 1. *attenuata*; leaves still narrower elongate attenuate apex obtuse.—Ceylon, *Thwaites.*

VAR. 2. *Helferi*; branchlets quadrangular, berries $\frac{1}{4}$ in. diam.—Tenasserim or Andamans; *Helfer* (Kew Distrib. No. 2334).—This has been placed with *M. angustifolium* because of its narrow leaves, which are, however, more obtuse and less petioled than those of *M. angustifolium.* If not placed here, it must form an additional species near *M. varians* No. 12.

38. **M. phyllanthifolium,** *Thwaites ex Triana in Trans. Linn. Soc.* xxviii. 159; leaves $\frac{1}{2}$ in. nearly sessile narrow-oblong obtuse narrowed at the base coriaceous opaque.

CEYLON, alt. 5000 ft.; *Thwaites.*
Branches wiry, leaves approximate, resembling a small woody *Phyllanthus. Flowers* very small, usually 3 on an axillary peduncle about $\frac{1}{8}$ in. *Berry* small, spherical, crowned prominently by the calyx-limb, but not ripe.—Entirely unlike every other species in the genus.

39. **M. campanulatum,** *C. B. Clarke*; leaves $2\frac{1}{2}$–4 in. subepetiolate elliptic acute base attenuated opaque, calyx-tube at the time of flowering distinctly campanulate.

MALACCA; *Griffith*, Memecylon No. 5 (No. 2325 (not 2325–1 nor 2325–2) of Kew Distrib.).
Leaves suddenly narrowed, sometimes very shortly acuminate. *Peduncle* 0; pedicels $\frac{1}{8}$-$\frac{1}{5}$ in., clustered. *Calyx-tube* even in the bud campanulate, limb truncate. *Buds* somewhat acute. *Disc* on the apex of the ovary depressed, very obscurely rayed.—This has been treated as a var. of No. 23 *M. cæruleum*, Jack; it seems very much nearer *M. lævigatum*, from which it differs chiefly in the round (not acute) base of the calyx-tube at the time of flowering.

40. **M. edule,** *Roxb. Cor. Pl.* t. 82; leaves $1\frac{1}{2}$–$3\frac{1}{2}$ in. elliptic or ovate acute at both ends hardly acuminate, petiole $\frac{1}{8}$-$\frac{1}{5}$ in., nerves obscure, calyx-tube at the time of flowering saucer-shaped limb truncate.

EASTERN PENINSULA and CEYLON.
Flowers medium-sized, blue rarely white; buds obtuse or at least not very acute. *Calyx-tube* at the time of flowering saucer-shaped, limb truncate. *Disc* at the apex of the ovary depressed, obscurely rayed. *Berry* $\frac{1}{4}$ in. diam., black-purple, globose or slightly ovoid, mouth about $\frac{1}{8}$ in. wide.—The first three varieties run completely together which will account for the variety of quotation of the synonyms by authors: var. 4 recedes further from the type. The remaining varieties are called species by most authors. *M. myrsinoides*, Blume, differs from *M. edule* by its quadrangular branchlets. Triana reduces *M. umbellatum, Wall. Cat.* 4109, to *M. myrsinoides, Blume*: but the examples of Wallich 4109 have the branchlets exactly round.

VAR. 1. *typica*; peduncles clustered $\frac{1}{8}$-$\frac{1}{4}$ in., leaves acute or obtuse. M. edule, *Roxb. Fl. Ind.* ii. 260; *DC. Prodr.* iii. 6; *Wall. Cat.* 4107; *Dalz. & Gibs. Bomb. Fl.* p. 93; *Kurz For. Fl.* i. 512. M. edule var. *a.*, *Thwaites Enum.* 111. M. umbellatum, *Burm. Fl. Zeyl.* t. 31. M. tinctorium, *Kœn. ex W. & A. Prodr.* 319; *Wight Ill.* t. 93. M. globiferum, *Wall. Cat.* 4108. M. pyrifolium, *Naud. in Ann. Sc. Nat.* ser. 3. xviii. p. 277.

VAR. 2. *ramiflora*; inflorescence densely clothing the branches, peduncle often (but not always) wanting. M. edule, *Lamk. Dict.* iv. 88; *DC. Prodr.* iii. 6; *W. & A.*

Prodr. 319. M. sessile, *Wall. Cat.* 4112 *ex W. & A. Prodr.* 320. *Not* M. ramiflorum, *Griff. Notul.* iv. 673.

VAR. 3. *capitellata*; peduncle more elongated sometimes 1 inch. M. capitellatum, *Linn.*; *DC. Prodr.* iii. 6; *Roxb. Hort. Beng.* 28. ? *Lamk. Ill.* t. 284.

VAR. 4. *ovata*; leaves often 4 in. more rounded at the base more acute sometimes subacuminate at the apex. M. ovatum, *Sm. ex Kurz For. Fl.* i. 512. M. edule, var. γ, *Thwaites Enum.* 110. M. umbellatum, *Hb. Heyne in Wall. Cat.* 4109. M. tinctorium, var. β, *W. & A. Prodr.* 319. M. prasinum, *Naud. in. Ann. Sc. Nat.* ser. 3. xviii. p. 275. M. grande, *Wall. Cat.* 4103, *partly.* M. lucidum and pyrifolium, *Presl Epim. Bot.* 209, 210.

VAR. 5. *læta*; nerves distinct, peduncles elongate often 1–1½ in., pedicels 0, calyx prominently 4-toothed. M. capitellatum, *Thwaites Enum.* 110 (*not of Linnæus*).—Ceylon; *Thwaites* No. 1564, 1565; *Walker*; *Moon*; *Major Champion.*—Called *Samara læta* by Moon in Herb. by which he understood Burmann's *Fl. Zeyl.* t. 30: also *M. Walkeri*, Hook. in Herb.: also marked *nov. sp.* by Triana in Herb. Hook.

VAR. 6. *rubro-cærulea*, Thwaites Enum. 415 (sp.); Triana in Trans. Linn. Soc. xxviii. 159.—Ceylon; East Matelle; *Thwaites.*—Mr. Thwaites says this differs from *M. edule* by the leaves more acuminated with the base more rounded. But the specimen (No. 3809) sent to Kew has the leaves very obtuse not at all acuminated, and narrowed into the petiole at the base: in short it is a typical example of *M. edule* var. 1 *typica.*

VAR. 7. *cuneata*, Thwaites Enum. 112 (sp.); Triana in Trans. Linn. Soc. xxviii. 159.—Ceylon; alt. 3000 ft.; *Thwaites* No. 2538.—The leaves are cuneate attenuate at the base, so that in some there is hardly any petiole; otherwise the same as *M. edule.*

VAR. 8. *leucantha*, Thwaites Enum. 110 (sp.); Triana in Trans. Linn. Soc. xxviii. 159.—Ceylon; alt. 3000–5000 ft.; *Thwaites*; *Gardner.*—This differs from *M. edule* by its white flowers and its leaves more distinctly nerved.

VAR. 9. *scutellata*, Triana in Trans. Linn. Soc. xxviii. 157. M. myrtifolium, *Wall. Cat.* 4111. M. obtusum, *Wall. Cat.* 4110. M. punctatum, *Presl*, and scutellatum, *Naud. ex Kurz For. Fl.* i. 513.—Transgangetic Peninsula from Chittagong to Singapore.—DISTRIB. Malay Archipelago. *Leaves* very thick, opaque, obscurely punctulate on both surfaces, narrowed much at the base, subepetiolate; otherwise much like *M. edule* type.—Kurz separates specifically *M. punctatum*, Presl, having the calyx with a tubercled base, from *M. scutellatum*, Naud. having the calyx with a smooth base. But both these descriptions of calyx may be seen on one branchlet, as in Helfer No. 2330 Kew Distrib.: the tuberculation is caused by an insect.

VAR. 10. *Thwaitesii*; calyx-tube in the bud distinctly campanulate, teeth after flowering triangular. M. umbellatum, *Thwaites* No. 387, *not of Burmann.*—Ceylon, alt. 3000 ft.—Burmann states that his *umbellatum*, *Fl. Zeyl.* t. 31 is called Wary-kaha by the Cinghalese, a name attributed by Thwaites to *M. capitellatum*, Linn. It appears closely allied to *M. capitellatum*, Linn. but the very broad base of the calyx in bud is unlike *M. edule.*

VAR. 11. *Rottleriana*; inflorescence lax extending 2–2½ in.—Deccan Peninsula? —Called *M. capitellatum* by Heyne in Herb. Rottler and probably the extreme form of that variety.

VAR. 12. *molesta*; branchlets distinctly quadrangular.—Anamallay Mts.; *Wight* No. 1072.—Wight's specimens are ample and beautifully preserved: they are exactly *M. edule* var. 2. *ramiflorum*, except that the branchlets (and even the branches) are quadrangular. They are sufficient to shake the faith of any botanist in the whole existing arrangement of the species of *Memecylon.*

DOUBTFUL AND EXCLUDED SPECIES.

M. SUBQUADRANGULARE, *DC. Prodr.* iii. 6; no example known, and not recognisable from description.

M. ROYENII, *Blume Mus. Bot.* i. 360, is probably some form of *M. edule*, Roxb., for Blume states that it is the Wellie Kala of Burmann's herbarium.

M. FLORIBUNDUM, *Wall. Cat.* 4113 is a *Eugenia.*

M. PYRIFORME, *Wall. Cat.* 4106 is not Melastomaceous.
M. PAUCIFLORUM, *Wall. Cat.* 4114 is *Canthium glomeratum,* Miq.
M. ACUMINATUM, *Wall. Cat.* 4105 is not a *Memecylon.*
M. SUBTRINERVIUM, *Miq.* var. *grandifolia,* Kurz in *Journ. As. Soc.* 1876, pt. ii. 131, from the Nicobars, with leaves 8–10 in., and obovoid-oblong berries $\frac{2}{3}$ in. diam., is perhaps next to *M. heteropleurum* No. 19, but we have seen no specimen.

Two branchlets with detached leaves and fruits collected by Dr. T. Anderson at Singapore are referred by Triana to *Pachycentria tuberculosa,* Korths, a Borneo species. The identification appears correct; but this very imperfect material is the only ground for supposing that the species has been collected within the limits of the present Flora.

ORDER LXI. **LYTHRACEÆ.** (By C. B. Clarke, F.L.S.)

Trees shrubs or herbs; branches often quadrangular. *Leaves* entire, opposite, sometimes alternate or whorled; stipules 0. *Inflorescence* various, often in cymes or panicles. *Flowers* hermaphrodite, regular, rarely oblique, unisexual in *Crypteronia. Calyx-tube* free, persistent; lobes 3–6, valvate, accessory often added. *Petals* as many as the calyx-teeth, rarely 0, inserted near the top of the calyx-tube. *Stamens* definite or very many, inserted on the calyx-tube. *Ovary* free, in the bottom of the calyx-tube (rarely inferior), 2–6-celled; style long, stigma capitate rarely 2-lobed; ovules very many, placentas axile (rarely parietal). *Fruit* coriaceous or membranous, free or more or less adnate to the base of the calyx, 2–6-celled or by imperfection of the partitions 1-celled, dehiscent or not. *Seeds* many, various in shape, angular round or winged, albumen 0; embryo straight, cotyledons convolute in *Sonneratia* and *Punica.*—DISTRIB. Species 250; in the tropics of the whole world especially of America; a few species scattered over the temperate zones.

Nesæa triflora, *Kunth,* introduced into Wight and Arnott's *Prodromus* (p. 307), is a Mauritian plant collected occasionally in India.

TRIBE I. **Ammannieæ.** Low or aquatic *herbs* with small or minute flowers. *Calyx* membranous.

Herbs growing in moist places . . . . 1. AMMANNIA.
Herb growing in water the flower-spike exsert . . . . 2. HYDROLYTHRUM.

TRIBE II. **Lythreæ.** *Trees* or *shrubs. Calyx* herbaceous or coriaceous. *Petals* often large wrinkled.

* *Calyx curved, flowers secund.*

Stamens declinate . . . . 3. WOODFORDIA.

** *Calyx straight, flowers symmetric.*

Flowers 6-fid. Capsule circumsciss . . . . 4. PEMPHIS.
Flowers 4-fid. Capsule irregularly breaking up . . . . . . 5. LAWSONIA.
Flowers minute subunisexual. Capsule 2-valved . . . . . . 6. CRYPTERONIA.
Flowers 6-fid. Capsule 3–6-valved. Seeds winged . . . . . 7. LAGERSTRŒMIA.
Flowers 4–8-fid. Capsule 4–8-valved. Seeds minute . . . . 8. DUABANGA.
Berry subglobose, 10–15-celled, ∞-seeded . . . . 9. SONNERATIA.

Anomalous genera with inferior ovary.

Calyx-lobes 5–7, thick. Stamens ∞ . . . . 10. PUNICA.
Calyx-lobes 5, small. Stamens 10 . . . . 11. AXINANDRA.

1. **AMMANNIA,** *Linn.*

Annual glabrous herbs growing in damp places; branches often quadrangular. *Leaves* opposite and alternate, sometimes whorled, entire; stipules 0. *Flowers* small, axillary, solitary and subsessile, or in small trichotomous cymes; bracteoles usually 2. *Calyx* campanulate or tubular-campanulate, 3–5-toothed, often with minute interposed teeth or folds. *Petals* 3–5 or 0, small, inserted between the calyx-teeth. *Stamens* 2–8, inserted on the calyx-tube. *Ovary* enclosed in the calyx-tube, 1–5-celled, the septa very thin often absorbed; style filiform or short, stigma capitate; ovules very many, placentas axile. *Capsule* membranous, globose or long-ellipsoid, enclosed in the calyx, 2–3-valved, or irregularly breaking up or circumsciss. *Seeds* many, often nearly covering the placenta which is often ultimately free central, small, smooth, round on the back, raphe on the inner face, ellipsoid or nearly hemispheric.—Distrib. Species 30, in the tropics and warm temperate zones of the whole world.

Subgenus I. **Rotala.** *Flowers* axillary, solitary or in sessile spikes. *Capsule* 2–4-valved.

* *Calyx in fruit campanulate, longer than broad.*

1. **A. peploides,** *Spreng. Syst.* i. 444; cauline leaves elliptic nerves prominent beneath, capsule 2-valved, seeds narrow-oblong subfalcate. *Boiss. Fl. Orient.* ii. 742; *Kurz in Journ. As. Soc.* 1877, pt. ii. 84. A. nana, *Roxb. Fl. Ind.* i. 427, *not of Wallich.* A. repens, *Rottl.*; *DC. Prodr.* iii. 80. Ameletia indica, *DC. Prodr.* iii. 76; *Wall. Cat.* 2093; *W. & A. Prodr.* 303; *Blume Mus. Bot.* ii. 135, t. 47; *Dalz. & Gibs. Bomb. Fl.* 96; *Wight Ic.* t. 257. A. elongata, *Blume Mus. Bot.* ii. 135. A. acutidens, *Miq. Fl. Ind. Bat.* i. pt. i. 617. A. polystachya, *Wall. Cat.* 2094. A. latifolia, *Wall. Cat.* 2096, *partly.* Peplis indica, *Willd. Sp. Pl.* ii. 244.

India; common, in rice fields &c. throughout the plains and in warm places in the lower mountains.—Distrib. Malaya to the Philippines and Canton; Cabul and Persia.

Stems decumbent often rooting or erect, 3–12 in. high. *Leaves* opposite, larger on the main stem, ½–¾ in., elliptic, narrowed at the base, sometimes almost petioled. *Flowers* often approximate in numerous sessile axillary spikes, solitary, sessile in the axils of reduced floral leaves; bracteoles 2, minute, lanceolate: or flowers sometimes strictly axillary, distant. *Calyx-tube* long-campanulate, scarcely striate; teeth 4, often pink, acute, triangular in fruit, accessory teeth obscure or 0. *Petals* 0, or 4 small. *Capsule* ellipsoid, longer than broad. *Seeds* pink, somewhat angular, hilum quite obscure.

2. **A. Ritchiei,** *C. B. Clarke*; cauline leaves elliptic nerves not prominent beneath, capsule 4-valved, seeds nearly hemispheric.

Belgaum, in rice fields, *Ritchie.*

Stems 6–12 in. rooting amongst floating weeds (Ritchie). *Leaves* opposite, cauline ½–¾ in., elliptic, sessile. *Flowers* solitary, distant, lower distinctly pedicelled. *Calyx* long-campanulate, truncate; teeth 4, minute, hardly so large as the minute interjected ones. *Petals* 4, minute, rose. *Capsule* ellipsoid, longer than broad, as long as the calyx-tube. *Seeds* brown-yellow, elliptic, peltate.

3. **A. rotundifolia,** *Ham. in Don Prodr.* 220; leaves orbicular, flowers sessile close-packed in terminal spikes, capsule 4-valved. *Roxb. Fl. Ind.* i. 425;

DC. Prodr. iii. 79; *W. & A. Prodr.* 306; *Wall. Cat.* 2095; *Wight Ic.* t. 258; *Kurz in Journ. As. Soc.* 1877, pt. ii. 85. A. latifolia, *Wall. Cat.* 2096, *partly.* A. subspicata, *Benth. in Hook. Lond. Journ. Bot.* i. 484. Ameletia rotundifolia, *Dalz. & Gibs. Bomb. Fl.* 96. A. subspicata, *Benth. in Hook. Kew Journ. Bot.* iv. 81.

INDIA; common, in rice fields &c. throughout the plains and in warm places in the lower mountains; not received from Ceylon.—DISTRIB. China, Formosa.

Rooting and creeping extensively so as often to form large patches in moist turf: stems usually 4–6 in., roundish and leafy. *Leaves* ½ in. diam., opposite, sessile or shortly petioled, nerved, approximate below becoming distant towards the spikes. *Flower-spikes* dense, pedunculate, often 3 sometimes one only, sometimes panicled; floral leaf one to each flower, ovate or oblong, bracteiform, bracteoles 0 or most minute. *Calyx-tube* campanulate, not elongate; teeth 4, acute, triangular, without interjected folds. *Petals* 4, obovate, twice the length of the calyx-teeth, bright rose. *Capsule* ellipsoid, a little longer than broad. *Seeds* brown-yellow, ellipsoid, peltate.—In this species, in *A. floribunda* below, and probably in others, the flowers are dimorphic; one kind has the stamens included and the style very long-exserted, the other kind has the stamens long-exserted and the style short: these are doubtless reciprocally fertile in the manner discovered by Mr. Darwin for *Lythrum Salicaria*. No stress must be laid on the descriptions of the length of the style in this genus.

4. **A. tenuis,** *C. B. Clarke*; leaves opposite ovate or elliptic, flowers sessile close-packed in terminal spikes, capsule 2-valved. Ameletia tenuis, *Wight Ic.* t. 257; *Dalz. & Gibs. Bomb. Fl.* 96.

CENTRAL INDIA from BANDA to the CONCAN and BEHAR. EAST BENGAL; *Griffith* No. 2310.

Erect, or but shortly creeping at the base; varying from simple stems 3–4 in. to very compound stems 8–10 in. *Leaves* ¼–½ in., sessile or nearly so, often acute. *Flower-spikes* dense, on filiform peduncles; floral leaf one to each flower, oblong or lanceolate, bracteoles lanceolate, exceeding half the length of the calyx. *Calyx-tube* campanulate, much more elongate than that of *A. rotundifolia*; teeth 4, acute, without interjected folds. *Petals* 4, obovate, not much longer than the calyx-teeth. *Capsule* ellipsoid, much longer than broad. *Seeds* brown-yellow, elliptic, peltate.

5. **A. floribunda,** *C. B. Clarke*; leaves alternate, upper narrow-oblong or linear, flowers sessile close packed in terminal spikes, capsule 2-valved. Ameletia floribunda, *Wight Ill.* 206, *not good and the reference to the figure wrong*; *Hook. Ic. Pl.* t. 826; *Dalz. & Gibs. Bomb. Fl.* 96. Nimmonia floribunda, *Wight in Madras Journ. of Science* vi. 34, t. 20.

Mahableshwur Hills, BOMBAY; *Law, Stocks.*

Erect or but shortly creeping at the base; stems often much branched, 8–10 in. Lower *leaves* 1–2 in., broad-oblong, obtuse, sessile, base broad, upper leaves ¼–½ in., linear or narrow-oblong. *Flower-spikes* dense on filiform peduncles; floral leaf one to each flower, oblong or lanceolate; bracteoles lanceolate, exceeding half the length of the calyx. *Calyx-tube* campanulate, elongate, like that of *A. tenuis*; teeth 4, acute, without interjected folds. *Petals* 4, obovate, nearly twice the calyx-teeth, bright rose. *Capsule* ellipsoid, much longer than broad. *Seeds* brown-yellow, elliptic, peltate.—Very closely allied to the preceding species.

6. **A. Rotala,** *F. Muell. Fragm.* iii. 108; leaves in whorls of 3–6 linear, flowers sessile axillary, capsule 3-valved. *Benth. Fl. Austral.* iii. 295. Rotala verticillaris, *Linn.*; *DC. Prodr.* iii. 76; *Wall. Cat.* 6321; *W. & A. Prodr.* 303;

Wight Ic. t. 260; *Dalz. & Gibs. Bomb. Fl.* 96; *Miq. Fl. Ind. Bat.* i. pt. i. 614. R. apetala, *F. Muell. Fragm.* iii. 108.—*Rheede Hort. Mal.* ix. t. 81.

DECCAN PENINSULA; *Wight, Rottler.* CONCAN, *Law.* CEYLON, abundant, *Thwaites.*—DISTRIB. Australia. Tropical Africa.

Erect or shortly creeping; stems 3–6 in. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ in., sometimes somewhat ovate at the base. Lower whorls of *flowers* often distant, upper sometimes almost spicate. *Calyx* tubular; teeth 3–5, small. *Petals* small, fugacious, or 0. *Stamens* 3–5. *Capsule* ellipsoid, longer than broad. *Seed* half-obovoid, the plane face somewhat excavated.—Hypobrichia Spruceana, *Benth. in Herb. Spruce* which has been reduced to a synonym of *Rotala verticillaris*, differs in its inflorescence and short calyx.

7. **A. dentelloides,** *Kurz in Journ. As. Soc.* 1870, pt. ii. 76; leaves opposite linear, flowers sessile axillary, capsule 2-valved.

SIKKIM TERAI near Siligori; *Kurz, C. B. Clarke.*

Stems 2–4 in., procumbent. *Leaves* $\frac{1}{4}$–$\frac{1}{3}$ in., linear or narrow oblong, obtuse. *Flowers* scattered, not at all spicate. *Calyx-tube* elongate-campanulate, 5-ribbed; teeth 5, triangular, acute; teeth and sometimes the whole tube with minute scattered hairs, accessory teeth 0. *Petals* minute. *Capsule* ellipsoid, much longer than broad. *Seed* half-ellipsoid, excavated on the plane face.

** *Calyx in fruit hemispheric, tube as broad as or broader than long.*

8. **A. pygmæa,** *Kurz in Seemann Journ. Bot.* v. 376; very minute, leaves opposite linear, flowers sessile axillary, capsule 2-valved.

KHASIA MTS., alt. 2000 ft., *H. f. & T.*; RAJMAHAL HILLS (Bengal), *Kurz*; throughout CHOTA NAGPORE, alt. 1000–2000 ft., *C. B. Clarke.* CALCUTTA; Botanic Garden, *Kurz.*

Stems tufted, 1–3 in. *Leaves* $\frac{1}{4}$–$\frac{1}{3}$ in., linear or narrow-oblong, at the base narrower almost petioled, obtuse often with two points (as described by Harvey in *Suffrenia capensis*). *Flowers* not spicate, most minute. *Calyx-tube* short; teeth 4, triangular, accessory teeth 0. *Petals* if any minute, not yet seen. *Stamens* 2 (occasionally 3–4 *Kurz*). *Capsule* spherical, slightly acute. *Seeds* black, half-ellipsoid or nearly half-spherical, excavated on the plane face.—Kurz says the capsule is 3-valved: the very perfect examples from Chota Nagpore have the capsule 2 valved *Suffrenia capensis*, *Harvey Thes. Capens.* ii. t. 189, differs from the Indian plant only in the larger and longer capsule. Compare *Rotala filiformis, Hiern in Oliv. Fl. Trop. Afr.* ii. 468, where Harvey's linear-leaved plant is united with the European *Suffrenia* which has oblong, broad-based leaves.

9. **A. simpliciuscula,** *Kurz in Journ. As. Soc.* 1871, pt. ii. 54; leaves opposite narrow-oblong, flowers solitary axillary shortly pedicelled, capsule 3-valved.

CHITTAGONG; tropical rice fields; *H. f. & T., Kurz.*

Stems decumbent, 1–2$\frac{1}{2}$ in. Lower *leaves* $\frac{1}{3}$ in., almost petioled, upper shorter, somewhat obovate. *Flowers* small, lower distant, upper approximate. *Calyx-tube* short; teeth 4, triangular, accessory teeth 0. *Capsule* globose, much longer than the calyx. *Seeds* black, subhemispheric, excavated on the plane face.

10. **A. pentandra,** *Roxb. Fl. Ind.* i. 425; cauline leaves opposite elliptic-oblong sessile faintly nerved, flowers solitary axillary sessile, capsule 3-celled. *DC. Prodr.* iii. 79; *W. & A. Prodr.* 305; *Wall. Cat.* 2102; *Blume Mus. Bot.* ii. t. 46; *Kurz in Journ. As. Soc.* 1877, pt. ii. 85. A. nana, *Roxb. in Wall. Cat.* 2105. A. rubra, *Ham. in Don Prodr.* 220; *Wall. Cat.* 2107. A. subspicata, *Herb. Hohenack.* No. 1611. A. densiflora, *Roth Nov. Sp.* 99; *DC. l. c.* 79;

W. & A. Prodr. 305. A. debilis, *Ait. in Herb. Zoll. & Mor.* Rotala Roxburghiana, *Wight Ic.* t. 260; *Wall. Cat.* 2105. Tritheca pentandra, *Miq. Fl. Ind. Bat.* i. pt. i. 614. Winterlia uliginosa, *Spreng. Syst.* i. 788. Sellowia uliginosa, *Roth l. c.* 163; *DC. l. c.* 380.

Throughout Tropical INDIA, in moist places, very common.—DISTRIB. China, Malaya: and (including the varieties below enumerated) Australia and Tropical Africa.

Stems 6–12 in., often with many opposite branches divergent at right angles and covered with flowers. Cauline *leaves* usually 1 in., upper floral leaves becoming bractiform, oblong, base broader. *Flowers* often approximate, never in distinct spikes; bracteoles subulate as long as the calyx. *Calyx-teeth* 5, lanceolate, very acuminate; accessory teeth 5, subulate, often as long as the primary teeth. *Petals* 5, narrow-obovate, small or 0. *Capsule* spherical or globose-depressed. *Seeds* black, hemispheric, excavated on the plane face.

VAR. *illecebroides*, Arn. in Herb. Wight; smaller, cauline leaves ⅓ in. A. nana, *Wall. Cat. partly not Roxb. nor Rottl.* Rotala ? decussata, *DC. Prodr.* iii. 76; *Hiern in Oliv. Fl. Trop. Afr.* ii. 467.

VAR. *fimbriata*, Wight Ic. t. 217 (sp.); cauline leaves longer narrower often cordate at the base, petals larger sometimes fimbriate. A. Heyneana, *Wall. Cat.* 2104. A. hexandra, *Wall. Cat.* 2103.—Wallich's example has six stamens, otherwise is exactly *A. fimbriata*, Wight.

SUBGENUS II. **Eu-Ammannia.** *Flowers* in whorls, cymes or clusters. *Capsule* circumsciss or bursting irregularly.

11. **A. baccifera,** *Linn.*; *Blume Mus. Bot.* ii. 133; cauline leaves opposite or alternate oblong or narrow-elliptic narrowed at the base, flowers in dense clusters forming knots on the stem or in looser but very short axillary cymes, capsule globose. *Dalz. & Gibs. Bomb. Fl.* 97; *Kurz in Journ. As. Soc.* 1877, pt. ii. 85. A. vesicatoria, *Roxb. Fl. Ind.* i. 426; *DC. Prodr.* iii. 78; *W. & A. Prodr.* 305; *Wall. Cat.* 2098, *partly.* A. indica, *Lamk.*; *DC. l. c.* 77; *W. & A. Prodr.* 305; *Wall. Cat.* 2099; *Blume l. c.* t. 46. A. debilis, *Ait. Hort. Kew*, ed. 1, i. 163. A. verticillata, *Boiss. Fl. Orient.* ii. 743, *not of Link.* Hapalocarpum vesicatorium and H. indicum, *Miq. Fl. Ind. Bat.* i. pt. i. 618. Cryptotheca apetala, *Blume Bijd.* 1128; *DC. l. c.* 76.

Throughout Tropical INDIA, in moist places, very common.—DISTRIB. Afghanistan. Malaya. China. Australia. Tropical Africa.

Glabrous, erect, 6–8 in. sometimes 2 ft. Lower *leaves* and branches usually opposite; cauline leaves 1–2½ in., usually narrow but obtuse. *Calyx-tube* hemispherical; teeth 4, broad, triangular, accessory folds or teeth small. *Petals* usually 0, or small. *Capsule* depressed, imperfectly circumsciss above the middle. *Seeds* black, subhemispheric, excavated on the plane face.

12. **A. salicifolia,** *Monti ex Blume Mus. Bot.* ii. 132; glabrous, leaves sessile lanceolate rounded at the base, flowers densely clustered in the axils, capsule globose depressed not covered by the calyx-teeth. *Dalz. & Gibs. Bomb. Fl.* 97. A. egyptiaca, *Willd. Hort. Berol.* t. 6. A. verticillata, *Lamk. Ill.* t. 77. f. 3, *not of Wight*; *DC. Prodr.* iii. 79. A. glauca, *Wall. Cat.* 2100; *W. & A. Prodr.* 305. A. densiflora, *Miq. in Herb. Hohenack.* No. 770.

PUNJAB; *Edgeworth, T. Thomson.* KUMAON, alt. 4000 ft.; *Strachey & Winterbottom.* BEHAR; *J. D. H.* EAST BENGAL; *Griffith.* CONCAN; *Stocks, Ritchie.* DECCAN PENINSULA; *Wight* 981; *Perottet.*—DISTRIB. Tropical Africa.

Glabrous, erect, sometimes 2 ft. high, leaves and branches opposite. Cauline *leaves* often 2 in. by less than ½ in., frequently cordate at the base. *Calyx* in fruit hemispheric; teeth 4, erect, triangular, too short to close over the capsule; accessory

folds usually present but small. *Capsule* reddish, exactly like that of *A. baccifera*. *Seed* half-obovoid, excavated on the plane face, one end much smaller than the other.—*A. verticillata*, Boiss. Fl. Orient. ii. 743, has the leaves attenuated to the base; and is therefore *A. baccifera, Linn.*, for the only character by which *A. baccifera* can be distinguished from *A. salicifolia*.

13. **A. cordata,** *W. & A. Prodr.* 304; glabrous, leaves sessile oblong cordate subamplexicaul, flowers 2–5 shortly pedicelled in each axil, capsule globose covered by the calyx-teeth. *Wall. Cat.* 6322. A. salicifolia, *Monti var. β. Thwaites Enum.* 121.

EAST BENGAL, Noakhali, *C. B. Clarke*. DECCAN PENINSULA; *Wight*. CEYLON; *Thwaites*.

Glabrous, erect, 12–18 in., leaves and branches opposite. Cauline *leaves* 1–1½ in., margins often white cartilaginous. *Flowers* very shortly pedicelled, but not congested. *Calyx-tube* campanulate with 4 green striations; teeth 4, triangular, connivent over the capsule; accessory teeth as 4 small prominent horns. *Capsule* globose, much larger than that of *A. salicifolia*, not becoming red pseudo-baccate as does that of *A. baccifera* and *A. salicifolia*. *Seeds* subhemispheric, excavated on the plane face.

14. **A. lanceolata,** *Heyne in Wall. Cat.* 2106 *B., C.*; leaves opposite oblong-elliptic attenuate to the base scarcely petioled, flowers 2–5 shortly pedicelled in each axil, calyx campanulate minutely pubescent, petals large. A. verticillata, *W. & A. Prodr.* 304, *exclud. all syn.* A. salicifolia, *Thwaites Enum.* 121, *as to var. a. only.—Rheede Hort. Mal.* ix. t. 84?.

DECCAN PENINSULA, *Wight*. Red hills of the Carnatic; *G. Thomson*. CEYLON; *Thwaites*.

Erect, 4–16 in., branches numerous, opposite. Cauline *leaves* 1–1½ in., margins often white cartilaginous, younger leaves usually puberulous punctate or subpubescent. *Flowers* not congested, often whorled; bracteoles linear, obtuse, green, as long as the calyx. *Calyx-tube* campanulate, ovoid; teeth 4, triangular, short, with 4 shorter triangular exterior teeth. *Petals* exceeding much the calyx, larger than in any other species of *Eu-Ammannia*. *Capsule* globose. *Seed* subhemispheric, excavated on the plane face.

15. **A. senegalensis,** *Lamk. Ill.* t. 77, f. 2.; leaves opposite elongate-oblong sessile subauriculate at the base, cymes peduncled compound, capsule $\frac{1}{12}$ in. diam. globose. *DC. Prodr.* iii. 77. A. auriculata, *Willd. Hort. Berol.* t. 7; *DC. l. c.* 80; *Boiss. Fl. Orient.* ii. 743.

Plains of the PUNJAB and of NORTH-WEST HINDOSTAN, ascending to 5000 ft. *Royle, T. Thomson, Edgeworth.*—DISTRIB. Afghanistan. Persia. Egypt. Tropical Africa. Australia.

Glabrous, erect, 6–24 in., branches sharply quadrangular. Cauline *leaves* 1–2 in. *Bracteoles* on the cyme-branches minute, linear. *Calyx* campanulate, with 4 or 8 green lines becoming indistinct in fruit; teeth 4, broad-triangular, teeth obscure. *Petals* 0 or caducous. *Stamens* 6 or 8. *Capsule* becoming ultimately red, much exceeding the calyx-tube. *Seeds* half-ellipsoid, excavated on the plane face.—This species is distinct so far as the Indian material is concerned. Some African examples have the cyme much closer and are doubtfully separable from *A. salicifolia* above. Kurz (in *Journ. As. Soc.* 1877, pt. ii. 85, 86) gives Chittagong as a locality for this plant: which may be so, or his plant may have been *A. cordata* No. 13.

16. **A. multiflora,** *Roxb. Fl. Ind.* i. 426; leaves opposite elongate-oblong sessile subauriculate at the base, cymes peduncled compound, capsule $\frac{1}{20}$ in. diam. globose. *DC. Prodr.* iii. 79; *W. & A. Prodr.* 305; *Wall. Cat.* 2101;

Boiss. Fl. Orient. ii. 743; *Dalz. & Gibs. Bomb. Fl.* 97; *Kurz in Journ. As. Soc.* 1877, pt. ii. 85.

Throughout INDIA on the plains.—DISTRIB. Afghanistan. Persia. Australia.

Glabrous, very erect, 6–24 in.; branches numerous, sharply quadrangular. Cauline *leaves* 1–1½ in. *Bracteoles* on the cyme-branches most minute, linear. *Calyx* campanulate, hemispheric or scarcely elongate; teeth 4, short-triangular. *Petals* 0, or small and caducous. *Stamens* 4, 6 or 8. *Capsule* often ultimately red, globose, not enclosed by the calyx. *Seeds* half-ellipsoid, excavated on the plane face.—Very closely allied to *A. senegalensis* and united with it by Mr. Hiern, perhaps correctly, but the two forms do not meet or pass into each other in India. *Cryptotheca dichotoma, Blume Bijd.* 1128; *DC. Prodr.* iii. 76 (Ammannia microcarpa, *DC. Prodr.* iii. 77), from Java and Timor, has been united with *A. multiflora Roxb.* by *Kurz in Journ. As. Soc.* 1871, pt. ii. 56, but differs in the much more elongate calyx-tube and larger cauline leaves: it is certainly very near *A. multiflora.*

17. **A. octandra,** *Linn. f. Suppl.* 127; leaves opposite linear-oblong subauriculate at the base, cymes very shortly peduncled 3–5-flowered, calyx in fruit large campanulate 4-angled with 8 distinct ribs. *Roxb. Cor. Pl.* t. 133; *Fl. Ind.* i. 425; *DC. Prodr.* iii. 80; *Wall. Cat.* 2097; *W. & A. Prodr.* 304; *Blume Mus. Bot.* ii. 132; *Dalz. & Gibs. Bomb. Fl.* 97; *Kurz in Journ. As. Soc.* 1877, pt. ii. 86. Ammanella linearis, *Miq. Fl. Ind. Bat.* i. pt. i. 619. Diplostemon octandrum, *Miq. l. c.* 615.

DECCAN PENINSULA; *Rottler*; *Heyne*; *Wight*; *G. Thomson.* CEYLON; *Thwaites.* CHITTAGONG; *Kurz.*—DISTRIB. Malaya.

Erect, 6–18 in., branches quadrangular, often scabrous. Cauline *leaves* 1–2 in., sometimes very narrow. *Calyx* in fruit $\frac{1}{5}$ in., often minutely pubescent or scabrid, nearly truncate; teeth 4, small. *Petals* $\frac{1}{12}$ in., obovate, rose-coloured. *Stamens* 8, filaments long, dark-red. *Capsule* somewhat ellipsoid, as long as the calyx. *Seeds* subhemispheric.—This species is reduced to *A. latifolia Linn.* by *Griseb. Fl. Brit. West Indies* 270; but the West Indian specimens, though like the Indian in leaves and habit, are entirely without the subalate angles of the ripe fruit which form the essential character of *A. octandra.*

18. **A. subrotunda,** *Wall. ex Kurz in Journ. As. Soc.* 1871, pt. ii. 55; "leaves sessile almost orbicular pinnate-nerved, flowers on slender short pedicels forming shorter or longer slender racemes."

BURMA OF EAST BENGAL; *Kurz.*—DISTRIB. Ava.

Not seen: diagnosis copied from Mr. Kurz.

2. HYDROLYTHRUM, *Hook. f.*

A glabrous aquatic herb. Lower *leaves* whorled, linear. *Spikes* exsert out of the water with oblong bractiform leaves. *Flowers* whorled, subsessile in the axils of bracts, lower whorls distant, upper approximate, often with opposite bracts; bracteoles 2, subulate. *Calyx* campanulate; teeth 4, triangular; accessory teeth 0. *Petals* 4, inserted between the calyx-lobes. *Stamens* 4, on the middle of the calyx-tube. Hypogynous *scales* 4, bifid. *Ovary* in the bottom of the calyx, free, 2-celled; style simple, stigma capitate; ovules not many, placentas axile. *Capsule* small, globose, 2-celled. *Seeds* 3 or 4 in each cell, ovoid, concave.—A genus only separable from *Ammannia* by habit: for hypogynous glands exist in *Amm. rotundifolia.*

1. **H. Wallichii,** *Hook. f. in Gen. Pl.* i. 777; *Hook. Ic. Pl.* t. 1007. Rotala, sp. *Wall. Cat.* 9059. R. (Mirkooa) myriophylloides, *Welw.*; *Oliv. Fl. Trop. Afr.* ii. 469. Ammannia Wallichii, *Kurz in Journ. As. Soc.* 1877, pt. ii. 84.

TAVOY; *Wallich.* MOULMEIN; *Lobb.*—DISTRIB. Java, Angola.

Stems 8 in., weak, little divided, probably erect in the water. *Leaves* ½–¾ in., about 8–12 in each whorl; emersed leaves ¼ in., acute or obtuse. *Calyx* without accessory teeth. *Petals* elliptic, rose-coloured, far exceeding the calyx-teeth. *Capsule* not ripe in the Indian examples, dehiscing septicidally from the apex in the African. —Mr. Hiern says (in *Oliv. Fl. Trop. Afr.* ii. 469) that the Angola plant is congeneric with the Tavoy plant; but it appears conspecific.

3. WOODFORDIA, *Salisb.*

A shrub. *Leaves* opposite, subsessile, entire, lanceolate, beneath whiter and with black glandular dots. *Flowers* in short panicled cymes on axillary peduncles, rarely solitary, scarlet; pedicels 2-bracteate at their base. *Calyx* long-tubular, slightly curved, mouth oblique; teeth 6, short, with 6 minute accessory teeth. *Petals* 6, small or 0, inserted at the top of the calyx-tube. *Stamens* 12, declinate, inserted on the calyx-tube below its middle. *Ovary* at the bottom of the calyx-tube, free, sessile, oblong, 2-celled; style filiform, stigma small; ovules very many, placentas axile. *Capsule* ellipsoid, membranous, included in the calyx. *Seeds* very many, narrowly cuneate-obovate, quite smooth, without hairs or papillæ.

1. **W. floribunda,** *Salisb. Parad. Lond.* t. 42; *Boiss. Fl. Orient.* ii. 737; *Brand. For. Fl.* 238. W. tomentosa, *Bedd. Fl. Sylv. Anal. Gen.* t. xiv. fig. 4. W. fruticosa, *Kurz in Journ. As. Soc.* 1871, pt. ii. 56; *For. Fl.* i. 518. Grislea tomentosa, *Roxb. Cor. Pl.* t. 31; *Fl. Ind.* ii. 233; *DC. Prodr.* iii. 92; *Bot. Mag.* t. 1906; *Wall. Cat.* 2110; *W. & A. Prodr.* 308; *Blume Mus. Bot.* ii. t. 45; *Miq. Fl. Ind. Bat.* i. pt. i. 621; *Dalz. & Gibs. Bomb. Fl.* 97. G. uniflora, *Rich. Fl. Abyss.* t. 52. G. punctata, *Ham.*; *DC. l.c.* 92; *W. & A. Prodr.* 308. G. micropetala, *Hochst. et Steud. in Herb. Schimp.* 1906. Lythrum fruticosum, *Linn. Sp. Pl.* 641.

Throughout INDIA, common; ascending to 5000 ft.; but not seen in the alluvial mud of Bengal.—DISTRIB. Beloochistan, Tropical Africa, Madagascar, China.

A shrub with long spreading branches, brilliantly red with flowers in the hot season. *Leaves* 2–4 in., opposite or subopposite, usually rounded or cordate at the base (but one African form has leaves attenuate at the base); usually grey pubescent beneath, sometimes quite glabrous. *Calyx* ⅓–½ in., bright red. *Petals* scarcely longer than the calyx-teeth. *Seed* (figured by Blume and by Beddome as densely covered by long papillæ and stated by Kurz to be papillose-pilose) in every example at Kew entirely glabrous not exhibiting at any period of its development the smallest trace of a papilla.—This shrub is very uniform in character throughout India: the African examples vary much more. It is trimorphic after the manner described by Mr. Darwin in *Lythrum Salicaria.* See *Hiern in Oliv. Fl. Trop. Afr.* ii. 481.

4. PEMPHIS, *Forst.*

A maritime shrub or tree, attaining 35 ft. *Leaves* opposite, oblong, entire, very thick, fleshy. *Flowers* axillary, solitary, peduncles 2-bracteate at their base. *Calyx-tube* campanulate, 12–∞-ribbed; teeth 6, short, with 6 shorter accessory teeth. *Petals* 6, inserted at the top of the calyx-tube, nearly as long as

it, obovate, wrinkled, white or rose. *Stamens* 12, inserted in two series towards the middle of the calyx-tube. *Ovary* free, at the bottom of the calyx-tube, 3-celled at the base; style long, stigma capitate; ovules many, ascending, placentas 3 sub-basal. *Capsule* coriaceous, obovoid or nearly globose, included in the calyx-tube or exsert nearly half its length, circumsciss somewhat irregularly, ultimately 1-celled. *Seeds* very many, long cuneate-obovoid, angular, smooth, standing out in all directions from what appears to be a free central placenta.

1. **P. acidula,** *Forst. Gen.* t. 34; *DC. Prodr.* iii. 89; *Wall. Cat.* 2108; *W. & A. Prodr.* 307; *Griff. Notul.* iv. 510; *Blume Mus. Bot.* ii. t. 43; *Miq. Fl. Ind. Bat.* i. pt. i. 619; *Bedd. Fl. Sylv. Anal. Gen.* t. xiv. fig. 5; *Kurz For. Fl.* i. 518. P. angustifolia, *Roxb. Fl. Ind.* ii. 465. Maclellandia Griffithiana, *Wight Ic.* t. 1996. Lythrum Pemphis, *Linn. f. Suppl.* 249; *Lamk. Ill.* ii. 408, fig. 2. Melanium fruticosum, *Spreng. Syst.* ii. 455.

Southern coasts of both PENINSULAS and of CEYLON.—DISTRIB. Tropical coasts of the Old World

Branchlets young leaves and inflorescence with short grey hairs. *Leaves* 1 by $\frac{5}{8}$ in. *Peduncles* $\frac{1}{4}$–$\frac{3}{8}$ in. *Capsule* $\frac{1}{5}$ in. diam.

5. LAWSONIA, *Linn.*

A glabrous erect shrub with round branches, sometimes spinous. *Leaves* opposite, entire, lanceolate. *Flowers* rather small, in large terminal panicled cymes; bracts small, deciduous. *Calyx-tube* exceedingly short; lobes 4, ovate. *Petals* 4, obovate, wrinkled, inserted at the top of the calyx-tube. *Stamens* usually 8, inserted in pairs between the petals, sometimes 4 only or 8 not paired. *Ovary* free, 4-celled (or 4-celled at the base); style very long, stigma capitate; ovules many, placentas axile. *Capsule* coriaceous, globose, exsert, irregularly breaking up, ultimately 1-celled. *Seeds* many, angular, pyramidal, smooth, packed on a central placenta.

1. **L. alba,** *Lamk. Ill.* t. 296, *fig.* 2; *DC. Prodr.* iii. 91; *Wall. Cat.* 2109; *W. & A. Prodr.* 307; *Wight Ill.* t. 87; *Miq. Fl. Ind. Bat.* i. pt. i. 620; *Boiss. Fl. Orient.* ii. 744; *Dalz. & Gibs. Bomb. Fl.* 97; *Bedd. Fl. Sylv. Anal. Gen.* xiv. fig. 6; *Brand. For. Fl.* 238. L. inermis, *Roxb. Fl. Ind.* ii. 258; *Griff. Ic. Pl. Asiat.* t. 580. L. spinosa, *Linn.*; *Lour. Fl. Cochinc.* 281. L. purpurea, *Lamk.*; *Spreng. Syst.* ii. 217.

Throughout INDIA, very common, cultivated; perhaps wild in Western India.—DISTRIB. Cabul, Persia. Cultivated in many tropical and warm temperate regions.

About 6 ft. high, often trimmed so as to make a close fence. *Leaves* $\frac{3}{4}$–$1\frac{1}{2}$ in., narrowed at the base, sometimes very shortly petioled, acute or obtuse. *Flowers* $\frac{1}{4}$ in. diam., sweet-scented, rose or white. *Sepals* $\frac{1}{12}$ in., permanent. *Capsule* size of a pea.

6. CRYPTERONIA, *Blume.*

Trees. *Leaves* opposite, petioled, entire, ovate or lanceolate. *Racemes* elongate, in branched panicles. *Flowers* minute, white or green, with short linear bracts at the base of the pedicels, polygamo-diœcious. *Calyx-tube* short, saucer-shaped, or longer subhemispheric; teeth 5 (rarely 4), valvate, persistent. *Petals* 0. *Stamens* as many as the calyx-teeth, inserted between them near the

top of the calyx-tube. *Ovary* free, globose, 2-celled; style long, stigma capitate sub-2-fid; ovules many, placentas axile. *Capsule* 2-celled, globose, pubescent, crowned by the persistent style, dehiscent at the vertex across the dissepiment so as to divide the style; fruit-pedicel deflexed. *Seeds* many, long-ellipsoid, testa produced at each end.—DISTRIB. Species 5 extending from Eastern Bengal to the Philippines.—The branches appear all functionally diœcious: those that perfect seed have all the stamens with short filaments: those that have stamens with long filaments have an ovary and style but set no seed.

1. **C. pubescens,** *Blume Mus. Bot.* ii. 123; leaves pubescent beneath, calyx-teeth short triangular, ripe capsule $\frac{1}{16}$ in. broad. Henslovia pubescens, *Wall. Cat.* 4904, and *Pl. As. Rar.* iii. 14, t. 221; *Miq. Fl. Ind. Bat.* i. pt. i. 716. H. pubescens *together with the pubescent portion of* H. affinis, *Planch. in Hook. Lond. Journ. Bot.* iv. 477, t. xvi. B.

RANGOON; *McClelland.* MERGUI; *Griffith,* No. 2512–2 (*marked H. affinis by Planchon*). PINANG.

Tree 30 ft. (attaining 80 ft. fide Kurz); branchlets nearly glabrous. *Leaves* 3–4½ in., from broad-elliptic to lanceolate, narrowed at both ends; pubescence beneath yellowish or brownish. *Panicles* pubescent; pedicels scarcely $\frac{1}{20}$ in. *Calyx* very small, in fruit being quite flat, not at all cup-shaped. *Capsule* in *H. pubescens Wall.* exactly the same size as in *H. affinis Planch.*: in both the fruits are sometimes barren and twice the normal size, probably from the attack of an insect.

VAR. *Hookeri*; leaves glabrous beneath, panicle pubescent or rarely glabrous. C. paniculata, *Kurz in Journ. As. Soc.* 1877, pt. ii. 86; *For. Fl.* i. 519, *not of Blume.* Henslowia Hookeri, *Wall. Cat.* 8566. H. affinis, *as to the glabrous portion, Planch. in Hook. Lond. Journ. Bot.* iv. 477. H. pubescens, *Griff. Notul.* iv. 404 and *Ic. Pl. Asiat.* t. 564, fig. ii.—Amherst and Tavoy; *Wallich.* Mergui; *Griffith* and *Helfer* (No. 2512 Kew Distrib.). Malaya; *Maingay* No. 650–2.—*Henslovia leptostachys,* Planch. (with which *H. paniculata,* Miq. coincides) differs by the smaller flowers much more remotely placed on more slender racemes. From Kurz's description (glabrous leaves) it seems that his *C. paniculata* exactly coincides with *Wallich's H. Hookeri,* and does not include (as Mr. Kurz supposes it does) the plant of Griffith. *C. pubescens* and *C. glabra* may possibly be united under *C. paniculata,* Blume, but *C. Griffithii* is distinct.

2. **C. glabra,** *Blume Mus. Bot.* ii. 123; leaves glabrous beneath, calyx in fruit somewhat cup-shaped with triangular-lanceolate suberect teeth, capsule $\frac{1}{18}$ in. broad. Henslovia glabra, *Wall. Cat.* 4093; *Planch. in Hook. Lond. Journ. Bot.* iv. 478; *Miq. Fl. Ind. Bat.* i. pt. i. 716.

KHASIA MTS., alt. 1000–3000 ft.; *Wallich; H. f. & T.* CHITTAGONG, alt. 1000 ft.; *H. f. & T.*—DISTRIB. Philippines.

An erect tree, 50–60 ft. *Leaves* lanceolate or elliptic-lanceolate, narrowed at both ends, membranous, nerves prominently raised beneath but slender. *Panicle*-branches glabrous or minutely pubescent; pedicels $\frac{1}{18}$ in.

3. **C. Griffithii,** *C. B. Clarke*; leaves glabrous very coriaceous, panicles and calyx covered with rusty red pubescence, pedicels $\frac{1}{20}$ in., calyx of male flower ⅛ in. broad with lanceolate erect teeth. Henslovia sp. *Griff. Notul.* iv. 406, and *Ic. Pl. Asiat.* t. 564, fig. i.

MALACCA; *Griffith* No. 2513. MALAYA; *Maingay.*

Leaves 5–7 in., elliptic-lanceolate, the nerves raised beneath and thick.—This is very near *C. Cumingii,* Planch. of the Philippines, and may be a variety of it. *C. Cumingii* has a grey pubescence on the panicle, the pedicels are ⅛ in. or more, the calyx is smaller.

7. LAGERSTRŒMIA, *Linn.*

Trees or shrubs. *Leaves* opposite, distichous (or the uppermost alternate), entire, oblong or ovate. *Panicles* axillary and terminal, usually trichotomous, sometimes dense; peduncles 2-bracteate at their apex; pedicels 2-bracteolate. *Flowers* often large. *Calyx-tube* funnel-shaped, smooth grooved angular or subalate; lobes 6 sometimes 7–9, ovate, subacute, valvate. *Petals* 6 sometimes 7–9 (or 0), inserted at the summit of the calyx-tube, clawed, wrinkled, margin crisped erose or fimbriate. *Stamens* very many, inserted near the bottom of the calyx-tube; filaments long, exsert. *Ovary* sessile, in the bottom of the calyx, 3–6-celled; style long, bent, stigma capitate; ovules very many, ascending, placentas axile. *Capsule* more or less adnate to the calyx, ellipsoid, coriaceous, smooth, 3–6-celled, 3–6-valved. *Seeds* many (rarely few), elongate, flat, erect, winged from their summit.—DISTRIB. Species 18, in South-east Asia extending to Australia; Burma being the centre of the genus.

SECT. I. **Velaga.** *Calyx-tube* smooth, neither ribbed nor subalate.

* *Calyx glabrous or puberulous, not fulvous-tomentose.*

1. **L. indica,** *Linn.*; *DC. Prodr.* iii. 93; petals $\frac{1}{2}$–$\frac{3}{4}$ in. long-clawed, capsule $\frac{1}{3}$ in. diam. nearly globose, calyx-teeth erect on the fruit. *Roxb. Hort. Beng.* 38; *Fl. Ind.* ii. 505; *Bot. Mag.* t. 405; *W. & A. Prodr.* 308; *Wight Ill.* t. 86; *Kurz For. Fl.* i. 521. L. elegans, *Wall. in Paxt. Mag. Bot.* xiv. 269, *with fig.* Velaga globosa, *Gaertn. Fruct.* t. 133.

Throughout INDIA; common in gardens; possibly wild in the eastern boundary.—DISTRIB. Cultivated throughout the warm parts of Asia originally from China.

A shrub, showy in flower. *Leaves* 2 in., glabrous, elliptic or oblong, sessile, acute or somewhat obtuse at each end, never acuminate. *Panicle* not condensed, minutely pubescent or glabrous. *Petals* bright pink. *Calyx-teeth* on the fruit long-triangular, erect but distant, thin not woody. *Seed* $\frac{1}{4}$ in. including its wing.

2. **L. parviflora,** *Roxb. Hort. Beng.* 38; *Cor. Pl.* t. 66; *Fl. Ind.* ii. 505; leaves glabrous or shortly pubescent beneath, petiole less than $\frac{1}{8}$ in., petals less than $\frac{1}{4}$ in., calyx-teeth ultimately woody erect closely adpressed to the fruit. *DC. Prodr.* iii. 93; *Wall. Cat.* 2119 *altogether not partly as say W. & A. Prodr.* 308; *Wight Ic.* t. 69; *Griff. Ic. Pl. Asiat.* t. 592; *Bedd. Fl. Sylv.* t. 31; *Dalz. & Gibs. Bomb. Fl.* 98; *Brand. For. Fl.* 239; *Kurz For. Fl.* i. 521. L. Fatioa, *Blume Mus. Bot.* ii. 125. Fatioa nepaulensis, *Wall.*; *DC. Prodr.* iii. 89.

At the base of the WESTERN HIMALAYA, alt. 1000 ft. Throughout the DECCAN PLATEAU (i.e. everywhere south from the Gangetic Plain), alt. 1000–3000 ft.; abundant. Not in Central Bengal, nor Ceylon.—DISTRIB. Ava.

A tree, attaining 60 ft. *Leaves* 2–3$\frac{1}{2}$ in., glabrous in the typical plant, oblong, acute or acuminate with the apex obtuse, beneath a lighter colour, often prominently reticulate. *Panicles* many- or few-flowered, not condensed. *Calyx* glabrous puberulous or minutely pubescent, in fruit somewhat funnel-shaped at the base, teeth small. *Petals* narow, white. *Capsule* variable in size, in the typical plant $\frac{3}{4}$–1 by $\frac{1}{2}$–$\frac{5}{8}$ in. *Seeds* (with the wing) $\frac{1}{2}$ in. and upwards.

VAR. 1. *majuscula*; leaves glabrous larger sometimes 4–5 by 2 in., fruit very large, sometimes exceeding 1$\frac{1}{2}$ by 1 in. L. lanceolata, *Bedd. Fl. Sylv.* t. 32, *not of Wall.*—Common on the north-eastern edge of the Deccan Plateau in Chota Nagpore and Behar.—Dr. Brandis (For. Fl. 240) supposes that Col. Beddome has made the grave

error of adding the fruit of one species to the leaves and flowers of another. Col. Beddome's figure is correct, but it is not *L. lanceolata Wall.* *L. corymbosa, Griff. in Herb.* is this, but the ticket of locality "East Bengal" is doubtful. This variety is not known from East Bengal.

VAR. 2. *benghalensis*; leaves pubescent beneath at least on the midrib, fruit smaller than in the type, often less than $\frac{1}{2}$ in., fruit-calyx campanulate instead of funnel-shaped at base. — Nipal; *Wall. Cat.* 2119 *partly.* Sikkim; alt. 1000–5000 ft.; *J. D. H., Gamble, C. B. Clarke.* Assam; *Mrs. Mack.* Birma; *Griffith, whence his Ic. Pl. Asiat.* t. 592.

3. **L. lanceolata,** *Wall. Cat.* 2120; leaves glabrous often very white beneath, petiole usually $\frac{1}{4}$ in., petals $\frac{1}{4}$–$\frac{1}{3}$ in., calyx-teeth ultimately thick patent or reflexed. *W. & A. Prodr.* 309; *Dalz. & Gibs. Bomb. Fl.* 98?; *Brand. For. Fl.* 240. L. microcarpa, *Wight Ic.* t. 109; *Bedd. Fl. Sylv.* t. 30.

MALABAR COAST; from Bombay to Travancore, plentiful; no specimen from Coromandel.

Tree 30–50 ft. *Leaves* 3 in., elliptic-lanceolate, narrowed to both ends. *Panicle* generally compound, never condensed. *Calyx* rarely glabrous usually pubescent, sometimes white and shortly tomentose. *Capsule* usually smaller than that of *L. parviflora*, $\frac{1}{2}$–$\frac{3}{4}$ by $\frac{1}{3}$ in.—A species distinguishable from all the forms of *L. parviflora* by its calyx-teeth patent in fruit and its longer petioles. Wallich's name is adopted in preference to that of Wight who confounded the plant with *L. parviflora.*

4. **L. venusta,** *Wall. Cat.* 2117; calyx-tube in bud smooth ovoid white puberulous with 6 linear accessory teeth outside the primary teeth, appearing as prominent horns on the buds.

BIRMA; Melloon on the Irrawaddy near Thayet Myoo; *Wallich.*

Leaves 3–4$\frac{1}{2}$ in., elliptic-oblong, acute, glabrous. *Panicle* large, not condensed, white, puberulous. *Bud* as large as a pea, much larger than that of *L. parviflora.*

** *Calyx with abundant fulvous or brown-red tomentum.*

5. **L. Rottleri,** *C. B. Clarke*; leaves stellately fulvous-tomentose beneath, capsule $\frac{3}{4}$ in. resembling that of *L. parviflora.*

DECCAN; *Rottler.*

Leaves 3 in., lanceolate, glabrous above, midrib tomentose; petiole $\frac{1}{8}$ in. *Panicle* lax, tomentose. *Calyx* in the bud fully $\frac{1}{4}$ in., with dense brown-red stellate wool without any trace of grooves or ribs. *Seed* $\frac{1}{2}$ in. including the wing.—Named by Rottler *L. hirsuta? Rheede Hort. Mal.* iv. t. 22; but this species, which is only known from Rheede's figure, is represented as having a deeply-grooved calyx.

6. **L. calyculata,** *Kurz in Journ. As. Soc.* 1872, pt. ii. 307; *For. Fl.* i. 522; leaves puberulous beneath, capsule $\frac{1}{4}$–$\frac{1}{3}$ in.

MARTABAN; *Kurz.*

A tree, 60–70 ft. *Leaves* 5–7 in., oblong, acuminate, short-petioled. *Panicles* compound, with ferruginous or fulvous tomentum. *Calyx* in fruit cup-shaped campanulate, closely adpressed to the capsule, without grooves or ribs, densely ferruginous-tomentose; lobes short-triangular, reflexed. *Capsule* oblong, shining.

SECT. II. **Adambea.** *Calyx-tube* grooved, ribbed or subalate.

† *Adult leaves glabrous or nearly so.*

7. **L. Flos-Reginæ,** *Retz Obs.* v. p. 25; petiole distinct usually ¼ in., calyx covered with hard white (sometimes ferruginous) tomentum, ribs 12- 14-flat or round not acute on the back, apex of the ovary glabrous. *Kurz For. Fl.* i. 524. L. Reginæ, *Roxb. Cor. Pl.* t. 65; *Hort. Beng.* 38; *Fl. Ind.* ii. 505; *DC. Prodr.* iii. 93; *Wall. Cat.* 2114; *W. & A. Prodr.* 308; *Wight Ic.* t. 413; *Blume Mus. Bot.* ii. t. 41; *Miq. Fl. Ind. Bat.* i. pt. i. 623; *Bedd. Fl. Sylv.* t. 29; *Dalz. & Gibs. Bomb. Fl.* 98; *Brand. For. Fl.* 240. L. macrocarpa, *Wall. Cat.* 2114. Adambea glabra, *Lamk. Dict.* 39.—*Rheede Hort. Mal.* iv. t. 20, 21.

From Assam to Malacca, abundant. Hills of the Deccan Peninsula, common; and in Ceylon. In North-West India only cultivated?.—Distrib. Malaya and China, in many cases perhaps cultivated.

A tree, reaching 50–60 ft., sometimes when old having on its trunk and larger branches a few strong straight spines 1–3 in. (See *Ham. in Trans. Linn. Soc.* xvii. 177.) *Leaves* 4–8 in., from broad-elliptic obtuse to long-lanceolate. *Panicle* large, lower branches often 6 in., curved, ascending, flowers scattered. *Petals* commonly 1 in. (sometimes more), mauve, margins erose-undulate, hardly fimbriate. *Calyx* in fruit thickened, woody; lobes triangular spreading. *Fruit* large, sometimes reaching 1¼ in. by 1 in. (Wallich reduced his *L. macrocarpa* number 913 to *L. Flos-Reginæ*, and also sank his herbarium names *L. oblonga* and *L. glaucescens.*)

Var. *angusta*, Wall. Cat. 2113; leaves 15 (excl. petiole) by 6 in.; fruit 1¾ in., more acute at the apex. Irrawaddy, *Wallich*. Rangoon; *McClelland*.—This may possibly be the plant which Mr. Kurz (*For. Fl.* i. 524) means to preserve as the species *L. macrocarpa.* Not merely the leaves on young plants but the leaves on Wallich's specimens near the panicle are very large.

8. **L. hypoleuca,** *Kurz in Journ. As. Soc.* 1872, pt. ii. 307; *For. Fl.* i. 523; leaves shortly petioled sometimes glaucous white beneath, calyx covered with hard white tomentum, ribs 12 acute.

Andamans, *Kurz.*

Tree 60–70 ft. *Leaves* 6–8 in., from ovate to ovate-lanceolate, acuminate or scarcely acute, attenuate or obtuse at the base. *Panicle* large, 1 ft. long, narrow-elongate, white, puberulous. *Petals* ½ in., oblong, lilac, undulate on the margin (*Kurz*). *Capsule* ⅝ in. (*Kurz*), oblong, mucronate, woody. *Calyx* much more acutely ribbed than that of *L. Flos-Reginæ,* but the teeth of the alternate ribs are very obscurely excurrent in Mr. Kurz's specimens.

9. **L. floribunda,** *Jack in Mal. Misc.* i. 38; petiole very short, calyx covered with ferruginous stellate woolly tomentum with 12 acute ribs, apex of hairy ovary. *DC. Prodr.* iii. 93; *Wall. Cat.* 2115; *Miq. Fl. Ind. Bat.* i. pt. i. 623 (*not Blume Mus. Bot.* ii. t. 41); *Griff. Notul.* iv. 509; *Kurz For. Fl.* i. 522.

Burma to Singapore; frequent.—Distrib. Siam, Malaya, China.

Tree 30 ft. *Leaves* 5–7 in., oblong, acute, subsessile, rounded at the base. *Panicle* large, lower branches often 6 in., ascending, curved, with rich brown stellate woolly tomentum. *Calyx* nearly equally 12-ribbed accessory teeth obsolete or obscure. *Petals* smaller than in *L. Flos-Reginæ,* at first of a more rosy colour but withering to mauve-purple. *Fruit* ½ by ¼ in.; calyx-teeth spreading, small, not woody.

Var. *cuspidata*, Wall. Cat. 2116 (sp.); accessory teeth of the calyx in the bud prominent appearing as 6 cusps at the summits of the alternate ribs.—Tavoy, Amherst, *Wallich*, who marks the species as *L. floribundæ prox.* It differs from the type in no point except the cusps mentioned.

10. **L. hexaptera,** *Miq. Fl. Ind. Bat.* i. pt. i. 623; calyx grey puberulous, teeth 6–9, ribs 6–9 almost winged alternate with the teeth, calyx-teeth in fruit spreading woody.

MALACCA; *Maingay* No. 653, 654.—DISTRIB. Celebes.

A moderate-sized tree (*Maingay*). *Leaves* 2–3 in., narrow elliptic-oblong, not acuminate, oblique, twisted at the apex, minutely ashy-puberulous beneath; petiole $\frac{1}{8}$ in. *Panicle* 4–6 in.; branches stout, ashy- or grey-puberulous. *Calyx* in the bud funnel-shaped not campanulate, smaller than that of *L. Flos-Reginæ*. *Petals* $\frac{1}{2}$–$\frac{1}{4}$ in., flat, shortly clawed, sparingly erose-undulate on the margin. *Fruit* $\frac{7}{8}$ by $\frac{5}{8}$ in., calyx-wings slightly enlarged on the fruit.—The specimens of Maingay are very perfect but are identified with Miquel's plant from his description only.

†† *Adult leaves pubescent beneath.*

11. **L. villosa,** *Wall. ex Kurz Pegu For. Report Append.* B. 54; leaves lanceolate acuminate pubescent on both surfaces, flowers small apetalous congested at the summits of the panicle-branches, calyx-ribs 6 obscure in the bud. *Kurz For. Fl.* i. 524.

BURMA; *Griffith* (Kew Distrib. No. 2240); *McClelland* (Lagerstrœmia sp. 9); *John Scott*; *Kurz*.

Tree 40–50 ft. (*Kurz*); branchlets panicles and leaves ashy-grey, pubescent. *Leaves* 2–3 in., finely acuminate, narrowed to the very short petiole. *Buds* very small, calyx-tube smooth, ribs only to be seen near the summit of the tube as six horns alternating with the primary calyx-teeth. *Capsule* $\frac{5}{8}$–$\frac{3}{4}$ by $\frac{1}{4}$ in., the calyx-tube finally distinctly ribbed.—The name *villosa* is not in Wallich's Catalogue nor does it exist on any specimen at Kew, so that it cannot be guessed where Mr. Kurz found it: but the species is very good and unmistakable.

12. **L. tomentosa,** *Presl Bot. Bemerk.* 142; leaves lanceolate acuminate stellately pubescent beneath, flowers with petals scattered on the panicle, calyx-ribs 12 prominent in the bud. *Kurz For. Fl.* i. 522. L. pubescens *Wall. Cat.* 2112.

BURMA; *Griffith & Helfer* (Kew Distrib. No. 2238, 2239); *John Scott*; *Kurz* No. 1976; *Brandis*.

Tree 70–100 ft. (*Kurz*); branchlets petioles and panicle fulvous stellate-woolly tomentose. *Leaves* 3–6 in., elliptic-lanceolate to narrow-lanceolate, adult glabrous reticulate above except the midrib which is fulvous stellate-tomentose; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. *Calyx* in the bud fulvous, tomentose, with 12 blunt ribs to the base. *Petals* $\frac{5}{8}$ in., finely clawed, erose, subfimbriate on the margin. *Capsule* $\frac{5}{8}$ by $\frac{1}{4}$ in., calyx-tube ultimately 6-ribbed (ribs corresponding to the primary teeth becoming obsolete); teeth triangular, reflexed.—In fruit the capsule and calyx become exactly like those of *L. villosa* and when the condensed panicle of *L. villosa* opens out in fruit, the two species are easily confounded. One sheet of *Wall. Cat.* 2112 marked *L. pubescens* is really *L. villosa*, but all the other sheets of *Wall. Cat.* 2112 are true. Among other tests, the leaves of *L. pubescens* are stellately hairy beneath, those of *L. villosa* are simply pubescent.

VAR. *Loudoni*, Teym. & Binn. Pl. Nov. in Hort. Bogor. cult. 1863, p. 27; leaves acute not acuminate, flowers not larger than in the type. *Kurz For. Fl.* i. 523.

8. DUABANGA, *Ham.*

Large glabrous trees with pendent quadrangular branches. *Leaves* opposite, distichous, large, short-petioled, long-oblong, acute, entire, cordate or rounded at the base. *Panicles* large, terminal, with opposite branches; flowers large. *Calyx-tube* wide, adnate to the base of the ovary; lobes 4–7, thick, valvate in the bud. *Petals* 4–7, clawed, obovate, crisped and undulate, white. *Stamens* very many, inserted on a perigynous ring. *Ovary* conical, 4–8-celled; style

bent, long, stigma capitate 4–8-lobed; ovules very many, ascending, placentas covering nearly the whole interior surface of the ovary-cells. *Capsule* globose on the thick spreading calyx, coriaceous, perfectly or imperfectly 4–8-celled, 4–8-valved. *Seeds* innumerable, minute, ellipsoid, testa produced at both ends in two tails much exceeding the length of the nucleus.—DISTRIB. Species 2, extending from Nipal south-eastwards to the Philippines and Borneo.

1. **D. sonneratioides,** *Ham. in Trans. Linn. Soc.* xvii. 178; flowering calyx nearly 1 in. wide at the base, petals 4–7 nearly 1 in., capsule 4–8-valved. *Hook. f. Ill. Him. Pl.* t. 11; *Kurz For. Fl.* i. 525. Lagerstrœmia grandiflora, *Roxb. Hort. Beng.* 38; *Fl. Ind.* ii. 503; *DC. Prodr.* iii. 93; *Wall. Cat.* 2111; *Blume Mus. Bot.* i. 109. Leptospartion grandiflorum, *Griff. Ic. Pl. Asiat.* t. 591.

NIPAL to MARTABAN; alt. 500–3000 ft.; common in the SIKKIM and BHOTAN TERAI.

Tree attaining 100 ft. *Leaves* commonly 10 by 3½ in; petiole usually ⅛–¼ in.—*D. moluccana* differs by the calyx in flower much narrower at base, the petals 4 smaller, the capsule 4-valved: but agrees closely in habit.

9. SONNERATIA, *Linn. f.*

Trees, growing near the sea, glabrous. *Leaves* opposite, petioled, coriaceous, entire. *Flowers* without bracts, large, three together at the summits of the branches, or axillary solitary. *Calyx* thick, coriaceous; lobes 4–8, lanceolate, valvate. *Petals* 0 or as many as the calyx-lobes and linear-oblong. *Stamens* very many, inserted in a circular band on the calyx-tube. *Ovary* nearly free, or adnate at the base to the calyx-tube, many-celled; style long, stigma capitate; ovules very many, ascending, placentas axile. *Berry* subglobose, supported by the persistent calyx, 10–15-celled. *Seeds* very many, small, curved, angular; cotyledons convolute.—DISTRIB. Species 4–5 on the tropical sea-shores of the Eastern hemisphere.

† *Stigma very large, umbrella-shaped.*

1. **S. apetala,** *Ham. in Syme Emb. Ava* iii. 313, t. 25; leaves narrow-oblong, calyx-lobes 4, petals 0, stigma more than ⅓ in. broad, capsule ½–¾ in. broad globose. *DC. Prodr.* iii. 231; *Roxb. Hort. Beng.* 38; *Fl. Ind.* ii. 506; *Roth Nov. Sp.* 233; *Wall. Cat.* 3642; *W. & A. Prodr.* 327; *Griff. Notul.* iv. 650; *Kurz For. Fl.* i. 527.

Common in the SOONDERBUN. DECCAN PENINSULA as far as the Concan, *Law.* TRANSGANGETIC PENINSULA to Moulmein, *Falconer.*

Tree attaining 40 ft., growing in mangrove swamps flooded by the tide. *Leaves* 3–4 by 1–1½ in., always narrow, attenuated at the base; petiole ¼ in. *Calyx* in flower ¾ in., style included or scarcely exsert. *Capsule* broader than high, convex at the top, walls not thickened.

†† *Stigma capitate, not very large.*

2. **S. acida,** *Linn. f. Suppl.* 252; leaves oblong or narrowly obovate-elliptic, calyx-lobes 6, petals 6 linear-oblong dark-red, capsule globose much depressed often 2 in. broad. *Roxb. Hort. Beng.* 38; *Fl. Ind.* ii. 506; *Roth Nov. Sp.* 233; *DC. Prodr.* iii. 231; *Wall. Cat.* 3641; *W. & A. Prodr.* 327; *Wight Ic.* t. 340; *Griff. Notul.* iv. 652; *Blume Mus. Bot.* i. 336; *Miq. Fl. Ind. Bat.* i. pt. i. 496; *Dalz. & Gibs. Bomb. Fl.* 98; *Brand. For. Fl.* 242; *Kurz For. Fl.*

i. 526. Rhizophora caseolaris, *Linn. Sp. Pl.* 635. Aubletia caseolaris, *Gaertn. Fruct.* i. t. 78.—*Rheede Hort. Mal.* iii. t. 40; *Rumph. Amb.* iii. t. 74.

BENGAL; *Griffith.* Soonderbun; *C. B. Clarke.* RANGOON, *McClelland.* PEGU; *Kurz.* DECCAN PENINSULA; *Rottler.* CEYLON; *Thwaites.*—DISTRIB. Java, Siam.

A small tree, not exceeding 15 ft. (Kurz), growing in mangrove swamps flooded by the tide. *Leaves* 3–4 by 1–1¾ in., attenuate almost to the base so that the petiole is subobsolete. *Buds* ellipsoid, calyx-tube not in the least angular. *Calyx* in flower 1 in. or more; style long-exserted sometimes 3 in. *Capsule* thick-walled, sometimes more than 2 in. broad, concave at the summit.—The Kew specimens are all narrow-leaved, the flowers 6-fid not 7–8-fid; but the examples are few and it is probable that to the synonyms above cited should be added *S. Pagatpat, obovata, evenia, lanceolata* for which see *Miq. Fl. Ind. Bat.* i. pt. i. 496, 497.

3. **S. Griffithii,** *Kurz Pegu For. Report Append.* B. 54; *For. Fl.* i. 527; leaves broad obovate obtuse, calyx-tube not at all angular, lobes 6–8, petals 0. S. alba, *Griff. Notul.* iv. 652 *not Smith.* ? S. neglecta, *Blume Mus. Bot.* i. 338.

BURMA; *Griffith* (Kew Distrib. No. 2433). PEGU and TENASSERIM; *Kurz.*

Leaves 3 by 2¼ in., narrowed at the base; petiole more than ⅛ in. *Buds* flowers and calyx exactly of *S. acida*; calyx-tube ovoid, perfectly free from ribs, petals wanting. *Fruit* unknown.—This seems an apetalous form of *S. acida*, but the leaves slightly differ from all the examples of that plant.

4. **S. alba,** *Smith in Rees Cyclop.* xxxiii. No. 2; leaves elliptic obtuse or obovate narrowed to a short petiole, calyx-tube 6–8-angular (obscurely so in the bud distinctly in fruit), lobes 6–8, petals 0, fruit broadly obconic. *DC. Prodr.* iii. 231; *Blume Mus. Bot.* i. 338; *Miq. Fl. Ind. Bat.* i. pt. i. 497; *Kurz For. Fl.* i. 526. S. mossambicensis, *Klotzsch in Peters Reis. Mossamb. Bot.* t. 12. S. acida, *Benth. in Fl. Austral.* iii. 301; *Hiern in Oliv. Fl. Trop. Afr.* ii. 483.—*Rumph. Amb.* iii. t. 73.

MERGUI; *Griffith* (Kew Distrib. No. 2432). PEGU; *Kurz.* MALAYA; *Maingay* No. 654-2.—DISTRIB. Tropical shores of Africa with its islands, Malaya and Australia.

A small tree not exceeding 15 ft. (Kurz), growing in the saline littoral forests. *Leaves* 3 in., oblong or nearly round, narrowed at the base; petiole ⅛–¼ in. *Flowers* the size of *S. acida*, with a very long style. *Fruit* 1 in. broad, calyx obconical at the base (not flat as in *S. acida*) ribbed as shown in Klotzsch' picture above cited.—This species was united with *S. acida* by Mr. Bentham, and the other writers at Kew have followed. Mr. Kurz has pointed out the distinction in the calyx; and there is a wide difference between the fruits so far as at present known; but the material is not ample.

10. PUNICA, *Linn.*

A large shrub; branchlets round, often armed. *Leaves* opposite subopposite or clustered, oblong or obovate, obtuse, entire. *Flowers* shortly pedicelled, axillary, solitary or somewhat clustered, large, orange-red. *Calyx-tube* funnel-shaped, coriaceous, adnate to the ovary below, enlarged above the ovary; lobes 5–7, persistent on the fruit. *Petals* 5–7, lanceolate, wrinkled, inserted between the calyx-lobes. *Stamens* very many, inserted round the mouth of the calyx. *Ovary* inferior with many cells in two whorls; style long, bent, stigma capitate; ovules very many, placentas in some cells axile in others parietal. *Berry* inferior, globose, many-celled. *Seeds* very many, angular, testa coriaceous with a watery outer coat; cotyledons convolute.

1. **P. Granatum,** *Linn. Sp. Pl.* 676; *DC. Prodr.* iii. 3; *Roxb. Hort. Beng.* 38; *Fl. Ind.* ii. 409; *Wall. Cat.* 3659; *W. & A. Prodr.* 327; *Wight Ill.* t. 97; *Griff. Ic. Pl. Asiat.* t. 634; *Boiss. Fl. Orient.* ii. 737; *Brand. For. Fl.* 241; *Kurz For. Fl.* i. 528. P. nana, *Linn.*; *Bot. Mag.* 634.

Cultivated throughout INDIA; probably wild in the north-west.—DISTRIB. Wild in Cabul and Persia; cultivated throughout the warmer regions of the globe.

Leaves commonly 2 by $\frac{1}{2}$–$\frac{3}{4}$ in., narrower at both ends especially at the base, intramarginal nerve distinct or obscure. Flowering *calyx* about 1 in., mouth $\frac{5}{8}$ in. broad. *Petals* $\frac{1}{2}$ in. or more. *Fruit* often 2 in. diam., containing much red juice round the seeds. (*The Pomegranate.*)

11. AXINANDRA, *Thwaites.*

Trees, glabrous or nearly so, branches quadrangular or terete. *Leaves* opposite, petioled, coriaceous, entire, acuminate, finely nerved beneath with an intramarginal nerve. *Racemes* simple, axillary, erect, the 3–5 terminal panicled; flowers small, pedicels short; bracteoles 3 at the base of each pedicel, minute, linear. *Calyx* superior, 5-lobed. *Petals* 5, small, triangular, caducous, inserted at the top of the calyx-tube. *Stamens* 10, in two whorls, 5 alternating with the petals and 5 others inserted just below; connective large; anthers small, subterminal. *Ovary* inferior, 5–6-celled; style straight, stigma simple; ovules in each cell 1–2, erect. *Capsule* half-superior, woody, ellipsoid, below adnate to the calyx-tube, above loculicidally 3–4 (rarely 5–6-) valved. *Seeds* erect, oblong, compressed, produced upwards into a wing; cotyledons flat.—DISTRIB. Species 4–5 from Ceylon, Malacca and Borneo.

A. EU-AXINANDRA. *Petals* convolute. *Ovule* 1 in each cell.

1. **A. zeylanica,** *Thwaites in Hook. Kew Journ.* vi. 66; branchlets acutely quadrangular, leaves rounded at the base, petiole about $\frac{1}{8}$ in., calyx-tube without ribs, style very short. *Bedd. Fl. Sylv.* t. 207.

CEYLON; Ambagamowa district, alt. 1500 ft.; *Thwaites.*

A large tree, 50–60 ft. (Thwaites). *Leaves* 4 by 2 in., gradually or suddenly acuminate. *Racemes* 2 in.; pedicels less than $\frac{1}{8}$ in., hardly lengthened in fruit. *Calyx* glabrous or microscopically puberulous. *Petals* falling off in a cap before expansion (Thwaites). *Capsule* 1 by $\frac{5}{8}$ in.; valves usually 3, very thick, woody.

B. NAXIANDRA, *Baillon. Petals* induplicate-valvate. *Ovules* 2 in each cell.

2. **A. Maingayi,** *C. B. Clarke*; branchlets terete, leaves narrowed at the base, petiole often $\frac{1}{4}$ in., calyx-tube at the time of flowering 10-ribbed, style long (exserted portion longer than the whole flower).

MALACCA; *Maingay* No. 654–2.

Leaves 4 by 2 in., gradually or suddenly acuminate. *Racemes* 2 in., more panicled than in *A. zeylanica*, panicle-branches quadrangular. *Calyx* and pedicel minutely puberulous, larger than in *A. zeylanica*. *Petals* expanding but caducous. *Fruit* not seen.—Closely allied to *A. Beccariana, Baill. in Bull. Soc. Linn. Paris* 1877, No. 16, 127, which has rather slenderer racemes and smaller flowers, the calyx hardly ribbed at the time of flower.

GENUS IMPERFECTLY KNOWN.

DICHOTOMANTHES, *Kurz in Seemann Journ. Bot.* ix. 194, is a tree imperfectly known possibly Lythraceous, collected by Dr. John Anderson in Yunan, as yet not found within the limits prescribed for the Flora of British India.

ORDER LXII. **ONAGRACEÆ.** (By C. B. Clarke, F.L.S.)

Herbs, rarely undershrubs, sometimes aquatic. *Leaves* opposite or alternate, entire or toothed, undivided (in *Trapa* the submersed leaves pinnatipartite), exstipulate. *Flowers* hermaphrodite, mostly axillary and solitary, or spiked or racemed towards the ends of the branches; subirregular. *Calyx-tube* wholly adnate to the ovary (half-adnate in *Trapa*), limb of 2–5 valvate lobes. *Petals* epigynous, alternate with the calyx-lobes, rarely 0. *Stamens* as many or twice as many as the petals, inserted with them. *Ovary* inferior (half-inferior in *Trapa*), 1–6-celled, most often 4-celled; style 1, cylindric or subulate, stigma capitate or nearly 2-lobed or 4-fid; ovules one or many in each cell, pendulous or half-ascending, placentas axile. *Fruit* various, dehiscent or indehiscent, membranous capsular or bony, 1- or several-celled, 1 or ∞-seeded. *Seeds* without albumen, or nearly so.—DISTRIB. Species 300, spread throughout the world, most abundant in the North Temperate Zone.

Œnothera is an American genus of which several species are cultivated in India: and among these *Œ. rosea* has run wild in the North-west Himalaya and in the Nilghiris; *Œ. tetraptera* and *Œ. odorata* have also run wild on the Nilghiris.

* *Seeds very many.*

† *Seeds comose* . . . . 1. EPILOBIUM.

†† *Seeds not comose.*

Stamens twice as many as calyx-lobes . . . . 2. JUSSIÆA.
Stamens as many as calyx-lobes . . . . 3. LUDWIGIA.

** *Seeds one or two.*

Terrestrial. Stamens 2 . . . . 4. CIRCÆA.
Aquatic. Stamens 4 . . . . 5. TRAPA.

1. **EPILOBIUM,** *Linn.*

Herbs. *Leaves* alternate or opposite, undivided, entire or toothed. *Flowers* axillary and solitary, or racemed or spiked towards the ends of the branches, purple or white, regular or irregular. *Calyx-tube* scarcely produced above the ovary, linear; teeth 4, lanceolate, deciduous. *Petals* 4, obovate, retuse or notched. *Stamens* 8, epigynous, 4 shorter. *Ovary* inferior, 4-celled; style cylindric, stigmas 4 spreading or more or less combined; ovules many, axile, ascending, attached along a double placental vertical line in the inner angle of each cell. *Capsule* linear, 4-celled, dehiscing from the apex loculicidally, valves 4 recurved from the seed-bearing quadrangular column. *Seeds* very many, obovoid or ellipsoid, crowned by long silky hairs.—DISTRIB. Species 50; spread throughout the temperate and cold regions of the world, plentiful in New Zealand: appearing in the mountains only of the warmer regions.

SECT. I. **Chamænerium.** *Flowers* irregular. *Stamens* deflexed on one side. *Style* bent on one side in æstivation.

1. **E. angustifolium,** *Linn.*; *Boiss. Fl. Orient.* ii. 745; leaves narrow lanceolate glabrous beneath or nearly so reticulating nerves prominent primary nerves diverging nearly at right angles from the midrib, peduncles approximate

in long terminal spikes. E. spicatum, *Lamk. Dict.* ii. 373; *DC. Prodr.* iii. 40; *Wall. Cat.* 6324.

Temperate WESTERN HIMALAYA, alt. 8000–12,000 ft.; from KASHMIR and Baltistan to GURWHAL.—DISTRIB. Western Asia, Europe, North America.

Glabrous or nearly so, except the calyx-tube which is covered with close white tomentum. *Stem* 2–4 ft. *Leaves* often 4–6 by ¾ in., all scattered, nearly sessile, acute, entire or obscurely denticulate. *Spike* of flowers soon naked, bracts narrow, caducous. *Calyx-segments* lanceolate, acuminate, purplish, subpetaloid, free to the base. *Petals* ½–⅝ in., rose-purple, obovate, clawed. *Style* somewhat hairy above the base; stigmas 4, distinct, spreading. *Capsule* 2½–3½ in., closely pubescent. *Seed* narrowly obovoid, smooth, coma fulvous.

2. **E. reticulatum,** *C. B. Clarke*; leaves narrow-lanceolate pubescent beneath reticulating nerves prominent primary nerves diverging at acute angles from the midrib, peduncles distant in the axils of leaves that are not bractiform nor caducous.

SIKKIM; alt. 10,000–14,000 ft.; Lachoong and Kongra Lama; *J. D. H.*

Stem round, uniformly pubescent, apparently of the height of that of *E. angustifolium*. *Leaves* 4 by ⅝ in., all scattered, nearly sessile, minutely denticulate, acute. *Calyx-segments* broad-lanceolate, acuminate, purplish, subpetaloid, free to the base. *Petals* ½–⅝ in., rose-purple, obovate. *Style* densely hairy above the base; stigmas 4, distinct, spreading. *Capsule* (not ripe) 3 in. on a peduncle 1½ in.—This species has leaves somewhat like those of *E. angustifolium* but the inflorescence of *E. latifolium*.

3. **E. latifolium,** *Linn.*; *DC. Prodr.* iii. 40; leaves oblong narrowed at both ends glabrous or minutely pubescent without reticulating veins, peduncles distant in the axils of leaves that are not bractiform nor caducous. E. speciosum, *Dcne. in Jacq. Voy. Bot.* t. 69. E. Gerardianum, *Wall. Cat.* 6326.

ALPINE WESTERN HIMALAYA; alt. 11,000–14,000 ft. KASHMIR; *Jacquemont, C. B. Clarke.* SIRMORE; *Gerard, Edgeworth.* KUMAON; *Strachey & Winterbottom.*—DISTRIB. Dahuria, Altai, Arctic Asia, Europe and America.

The typical plant is 1 ft. high and glabrous except the calyx-tube; some of the Himalayan examples have the stem pubescent apparently much taller and the leaves minutely pubescent. *Leaves* 1½–3 by ¼–¾ in., scattered and opposite, entire or very obscurely denticulate, obtuse rarely somewhat acute. *Calyx-segments* broad-lanceolate, acuminate, purplish, subpetaloid, free to the base. *Petals* ⅛–⅝ in., rose-purple, obovate. *Style* with a few scattered hairs above the base; stigmas 4, distinct, spreading. *Capsule* 3 in., closely pubescent. *Seeds* narrowly obovoid, smooth, coma fulvous.

SECT. II. **Lysimachion.** *Flowers* regular. *Stamens* and style erect.

* *Stigma distinctly 4-cleft with spreading lobes.*

4. **E. hirsutum,** *Linn.*; *DC. Prodr.* iii. 42; hairy, middle cauline leaves opposite or alternate sessile obovate-lanceolate narrowed nearly to the base denticulate-serrulate. *Boiss. Fl. Orient.* ii. 746. E. serratum, *Jacq. Journ.*

TEMPERATE WESTERN HIMALAYA; alt. 5000–7000 ft.; from KASHMIR to KUMAON; *Royle, Madden, Jacquemont, T. Thomson,* &c.—DISTRIB. Europe, Africa, Asia from the Himalaya northwards and westwards.

Stem 2–5 ft., round, uniformly hairy with glandular pubescence, and with scattered long white hairs numerous towards the ends of the branches. Middle cauline *leaves* usually opposite, often 3 in. or more by ⅝ in., sessile, semi-amplexicaul but not decurrent as lines down the stem, green and softly pubescent on both surfaces. *Sepals* green, oblong, acute in the expanded flower, in æstivation mucronate. *Petals* ⅜ in. *Stigmas* 4, distinct, spreading. *Capsule* 2–3½ in., hairy, lower peduncles ½–1 in.

Seeds ellipsoid or obovoid, $2\frac{1}{2}$ times as long as broad, little narrowed at the base, puncticulate, not papillose, coma fulvous.

VAR. *sericeum*, Benth. in Wall. Cat. 6325 (sp.); pubescence of the stem and leaves densely white silky (not tomentose). E. tomentosum, *Vent. Hort. Cels.* t. 90.—Distrib. the same as that of the typical *E. hirsutum*; into which this variety graduates.

VAR. *lætum*, Wall. Cat. 6329 (sp.) in part; middle cauline leaves much smaller often about 1 in. not semi-amplexicaul at the base little pubescent, no white silky hairs on the plant.—Kashmir; *Jacquemont.* Chumba, alt. 3000 ft.; *C. B. Clarke.* Kumaon; *Wallich*; near Almora, alt. 5000 ft.; *Strachey & Winterbottom.* Jullundur, alt. 1000 ft; *C. B. Clarke.*—This plant has been from the leaves supposed near *E. tetragonum*; but the examples show the stigmas decisively spreading, so that it is either a var. of *E. hirsutum* or a new species.

5. **E. parviflorum,** *Schreb.*; *DC. Prodr.* iii. 43; middle cauline leaves mostly opposite sessile oblong-lanceolate hairy, broadest part of the leaf in its basal third portion. *Boiss. Fl. Orient.* ii. 747.

WESTERN HIMALAYA; *Edgeworth*; Simla, *T. Thomson.*—DISTRIB. West Asia, Europe, North Africa.

Stem 2–3 ft., round, without lines, pubescent and with much crisped white hair. Middle cauline *leaves* $1\frac{1}{2}$–2 by $\frac{1}{2}$–$\frac{3}{4}$ in., dentate, pubescent over both surfaces. *Sepals* green, oblong, acute, in the bud mucronate. *Petals* usually smaller than those of *E. hirsutum* but are $\frac{3}{8}$ in. in the Himalayan plant. *Stigmas* 4, distinct, spreading but hardly revolute. *Capsule* 2–$3\frac{1}{2}$ in., sparingly hairy, lower peduncles $\frac{1}{2}$–1 in. *Seeds* ellipsoid or obovoid, $2\frac{1}{2}$ times as long as broad, little narrowed at the base, punctulate, not papillose, coma fulvous.—*Seed* exactly as that of *E. hirsutum*; punctulate by raised points, but these papillæ excessively minute.

VAR. *vestitum*, Benth. in Wall. Cat. 6327 (sp.); stem and leaves with fulvous shaggy hair, the stem itself somewhat glaucous.—Nipal; *Wallich.*

** *Stigmas combined or stigma clavate.*

† *Stem round, the hairs sometimes in lines and the bases of the leaves somewhat decurrent in lines, but the stem not clearly quadrangular.*

6. **E. roseum,** *Schreb.*; *Boiss. Fl. Orient.* ii. 749; stem uniformly hairy or with hairy lines, leaves petioled (shortly in nearly all the Indian forms) from ovate to narrow-lanceolate, seeds obovoid not fusiform nor gradually narrowed at the top.

TEMPERATE HIMALAYA, alt. 5000–11,000 ft.; common.—DISTRIB. West Asia and Europe.

VAR. *indicum*; middle cauline leaves lanceolate or ovate with crisped pubescence on the midrib beneath, lateral nerves slightly raised glabrous or hairy, capsules scattered long-pedicelled, seed punctulate points raised most minutely.—Baltistan and Kashmir to Kumaon, alt. 5000–11,000 ft., common.—*Stem* 2 ft., usually hairy all round, sometimes with four well-marked lines. Middle cauline *leaves* 1–2 in. opposite sometimes ternate, sometimes glabrous beneath except the midrib, more often with crisped hairs on the primary nerves also; petiole often less than $\frac{1}{8}$ in. but sometimes nearly $\frac{1}{4}$ in. *Peduncle* of the lower capsules often 1 in. or more. Coma of the *seed* very white in well-preserved examples, but often discoloured in others.—*E. lætum, Wall. Cat.* 6329, belongs mainly to *E. hirsutum*; but some of it belongs here and some to *E. tetragonum.* Large quantities of the form of this plant with broad ovate leaves and a petiole of $\frac{1}{8}$ in. or thereabout constitute *E. montanum var. himalayense* of Indian herbaria: but in all these the style is unmistakably clavate, not at all (or most obscurely) lobed at the summit.

VAR. *Dalhousieanum*; capsules often approximate, the lowest with a very short peduncle, seed rather narrowly ellipsoid prominently papillose.—From Kashmir to Sikkim, alt. 6000–9000 ft.; abundant about Dalhousie.—*Stem* round, uniformly pu-

bescent. *Capsules* typically in erect clusters, lowest peduncle usually less than ½ in. —This is one of the best marked forms of Indian Epilobiums and may be a good species; it is common in herbaria marked *E. montanum var.*, or *E. origanifolium var.* (by H. f. & T., *roseum* var.).

VAR. *anagallidifolium*, Lamk. (sp.) in Syme Engl. Bot. t. 506; stem 4–12 in. glabrous near the base with hairy lines in the middle uniformly minutely pubescent near the top, leaves small oblong obtuse nearly glabrous beneath, seeds most minutely papillose.—West Tibet; *Thomson.*—Agrees exactly with the figure of Syme: reduced to *E. alpinum Linn.* in *Boiss. Fl. Orient.* ii. 750 and in *Hk. f. Student's Brit. Fl.* 145. It differs slightly from *E. alpinum* by the less elongate seed very obtuse at the summit and the more petioled leaves; but runs into var. *indicum.*

1461 VAR. *cylindricum,* Don Prodr. (sp.) 222; stem glabrescent often with distinct hairy lines, leaves linear-lanceolate on longer petioles very little pubescent, capsules long-peduncled, seeds obovoid most minutely papillose. *DC. Prodr.* iii. 43; *Wall. Cat.* 6328.—From Kashmir to Sikkim, alt. 6000–10,000 ft.—This plant has numerous axillary short branchlets covered with linear-lanceolate leaves and has thus a general resemblance to *E. palustre,* but the petioles are long and the seeds not elongate.

7. **E. Hookeri,** *C. B. Clarke*; stem without lines uniformly pubescent, middle cauline leaves opposite nearly sessile elliptic-oblong broad or rounded at the base, glabrous beneath except the greatly raised nerves, seeds ellipsoid. Epilobium No. 11, *Herb. Ind. Or., H. f. & T.*

KHASIA MTS., alt. 3000–6000 ft., common.—DISTRIB. Japan.

Stem 2–3 ft., quite round, usually thick set with leaves. *Leaves* 1¼ by ⅝ in., denticulate; nerves much impressed above, elevated and covered with crisped pubescence beneath. *Petals* ¼ in., purple. *Stigma* clavate, elongate. *Capsules* 2–3 in., scattered, lower peduncles often ½ in. *Seeds* obtuse, not narrowed at the apex, only slightly narrowed at the base, most minutely papillose, coma fulvous.

8. **E. khasianum,** *C. B. Clarke*; stem without lines uniformly villose, middle cauline leaves opposite subsessile elliptic-oblong villous over both surfaces, seeds ellipsoid. Epilobium No. 6, *Herb. Ind. Or., H. f. & T.*

KHASIA MTS., alt. 4500–5500 ft.; *T. Lobb, Griffith, H. f. & T., C. B. Clarke.*

Stem 2–3 ft., quite round. *Leaves* 1½ by ⅝ in., approximate, clothed with tawny hair, nerves impressed. *Petals* ½ in. and upwards. *Stigma* clavate, very obscurely lobed. *Capsules* 2–3 in., scattered, little pubescent, lower peduncles ½–1 in. *Seeds* obtuse, not narrowed at the summit, only slightly narrowed at the base, most minutely papillose, coma fulvous.—This differs from *E. Hookeri* in its villous indumentum and very large flowers, but may be a form of it. It also in its hairiness and shape of the leaves resembles *E. parviflorum var. vestitum*; but the stigma in *E. khasianum* is hardly lobed.

9. **E. palustre,** *Linn.*; *DC. Prodr.* iii. 43; stem without lines glabrous or with scanty sparse pubescence, leaves narrow-oblong rarely elliptic sessile or nearly so glabrous or nearly so, seeds (in the Indian forms) obovoid not narrowed upwards. *Boiss. Fl. Orient.* ii. 748.

NORTHERN KASHMIR and Baltistan; alt. 8000–14,000 ft.; *T. Thomson, C. B. Clarke.*—DISTRIB. Northern Asia, Europe and America; but the Indian three forms all recede from the European type in their abbreviated seeds.

1413 VAR. *typicum*; stem 8–10 in., middle cauline leaves 1–1¼ by ⅛ in., entire or scarcely dentate, capsules 2 in., scattered, lower peduncle often ¾ in., seeds ellipsoid, not at all narrowed at top not greatly narrowed at the base most minutely papillose, coma fulvous.—This form agrees closely with the European type, but the seed is entirely without the beak or production of the testa at the apex.

1414 VAR. *majus*; stem 1–2 ft., middle cauline leaves 2–3 in. often much denticulate sometimes petioled and sometimes broader elliptic when the plant can only be dis-

tinguished from *E. roseum var. indicum* by its greater glabrousness and obtuser leaves.

VAR. *minimum*; stem 3–4 in. with 1–2 capsules, flowers and leaves very small.—This in general appearance coincides with *E. alpinum, Linn.* but the seeds are broadly obovoid not at all elongate upwards.

10. **E. origanifolium,** *Lamk. Dict.* ii. 376; middle cauline leaves opposite sessile or very shortly petioled ovate or ovate-oblong, seeds elongate narrow obovoid somewhat narrowed at the top. *DC. Prodr.* iii. 41; *Boiss. Fl. Orient.* ii. 750.

ALPINE HIMALAYA, alt. 9000–14,000 ft.; from KASHMIR to SIKKIM.—DISTRIB. Northern cool temperate and Arctic zone.

Greatly varying in the size of stem, leaves and flowers. *Stem* usually 8 in., sometimes 2 ft., usually with 2 hairy lines, sometimes exactly terete and uniformly pubescent. Middle cauline *leaves* usually 1 in., sessile, ovate, pubescent only on the somewhat raised nerves beneath; but the leaves are sometimes petioled, nearly 3 in., pubescent, sometimes $\frac{1}{2}$ in. sessile glabrous. *Flowers* usually few, approximated towards the ends of the branches. *Petals* usually less than $\frac{1}{4}$ in.; in the *var. E. Balansæ Boiss.* (collected by J. D. H. also in Sikkim) the petals exceed $\frac{3}{8}$ in. *Capsule* $1\frac{1}{2}$–3 in., peduncle also variable in length. *Seed* minutely puncticulate, coma fulvous.

VAR. *villosum*; stem villous, leaves $\frac{3}{4}$–1 in. villous over both surfaces sessile ovate.—Sikkim, alt. 10,000–12,000 ft.; Latong, *J. D. H.* Epilobium No. 7, *Herb. Ind. Or. H. f. & T.*—*Stems* 4–8 in., little divided. *Leaves* acute, nearly all opposite. *Flowers* few, approximated, not large. *Stigma* clavate. *Capsule* half-ripe, seeds not seen.—A remarkable plant. The lowest leaves are small thick obovate rounded glabrous, greatly resembling the similar leaves in *E. origanifolium.*

11. **E. alpinum,** *Linn.*; *DC. Prodr.* iii. 41; stems weak somewhat pubescent, middle cauline leaves opposite small subsessile narrow-elliptic glabrous or pubescent on the nerves beneath, flowers few towards the end of the branches. *Boiss. Fl. Orient.* ii. 750.

SIKKIM; alt. 12,000 ft.; Lachen, *J. D. H.*; Jongri, *C. B. Clarke.*

Stems 2–10 in., slender, scarcely divided. Middle cauline *leaves* $\frac{1}{4}$–1 in., denticulate obscurely or prominently, scarcely acute. *Capsule* $1\frac{1}{2}$ in., peduncle $\frac{1}{4}$–$\frac{1}{2}$ in. *Seeds* minutely papillose, narrowly ellipsoid, little narrowed at the summit; coma silky, white.—This is perhaps *E. alpinum* of Boissier but is not the ordinary European plant which has a beaked seed as described in Hk. f. Student's British Flora, p. 145; the European examples also have a fulvous coma.

†† *Stem clearly quadrangular.*

12. **E. tetragonum,** *Linn.*; *DC. Prodr.* iii. 43; middle cauline leaves mostly opposite oblong or narrow-elliptic glabrous but with crisped hair on the raised nerves beneath usually denticulate-serrulate rarely acute. *Boiss. Fl. Orient.* ii. 748. E. brevifolium, *Don Prodr.* 222.

SIKKIM, alt. 5000–12,000 ft., very common. KHASIA MTS., alt. 4000–6500 ft., common.—DISTRIB. Cold and cool temperate zones of both hemispheres, and at temperate elevations on mountains in the warmer zones.

Stems 1–3 ft., with crisped pubescence on the four angles. Middle cauline *leaves* opposite, $\frac{1}{2}$–2 in., usually sessile, but in some Indian examples distinctly petioled, nerves beneath raised often very prominently, above much impressed. *Flowers* rose or purple, rather small. *Capsule* $1\frac{1}{2}$–2 in.; peduncle $\frac{1}{4}$–$\frac{1}{2}$ in. *Seeds* narrowly elliptic, not narrowed at the summit, very little narrowed at the base, minutely papillose, coma fulvous.

VAR.? *amplectens*, Wall. Cat. 6330; stem obscurely quadrangular or the bases of the leaves confluent and decurrent in two hairy lines, leaves nearly sessile often somewhat rounded at the base.—Kumaon; *Wallich.* Sikkim, alt. 10,000–13,000 ft. (Tungu and Lachen); *J. D. H.*

Except that the hairy lines down the stem are strongly marked this plant might be *E. origanifolium* above.

DOUBTFUL SPECIES.

E. laxum, *Royle Ill.* p. 211, t. 43. The figure shows the stem uniformly hairy, while the letterpress states that there are four lines on the stem.

2. **JUSSIÆA,** *Linn.*

Herbs or undershrubs, growing usually in swamps. *Leaves* alternate, undivided, mostly entire. *Flowers* yellow or white, axillary, solitary; pedicel usually 2-bracteate at the apex. *Calyx-tube* scarcely produced above the ovary, linear; teeth 4–6, acute, persistent. *Petals* 4–6, epigynous. *Stamens* double the number of petals, epigynous. *Ovary* inferior, 4–5-celled; style simple, usually very short, stigma 4–5-lobed; ovules ∞, axile, in several vertical rows at the inner ang.e of each cell. *Capsule* linear, round or angular, 4–5-celled, 8–10-ribbed, opening septicidally in valves separating from the persistent ribs or irregularly between the ribs. *Seeds* very many, without coma.—DISTRIB. Species 30, in the tropics of the whole world, most numerous in America.

1. **J. repens,** *Linn.*; *DC. Prodr.* iii. 54; creeping or floating, leaves obovate or oblanceolate obtuse narrowed into the petiole, petals 5 (rarely 6) white the veins at base slightly yellow, capsule woody, seeds quadrate with a white corky testa. *Ham. in Trans. Linn. Soc.* xiv. 305; *Roxb. Hort. Beng.* 33; *Fl. Ind.* ii. 401; *Wall. Cat.* 6331; *Hook. Bot. Misc.* iii. 300, t. 40; *W. & A. Prodr.* 336; *Miq. Fl. Ind. Bat.* i. pt. i. 628; *Gibs. & Dalz. Bomb. Fl.* 98; *Boiss. Fl. Orient.* ii. 751; *Kurz in Journ. As. Soc.* 1877, pt. ii. 90. J. fluviatilis, *Blume Bijd.* 1132; *DC. l. c.* J. Swartziana, *DC. l. c.* J. floribunda, *Griff. Notul.* iv. 688. Cubospermum palustre, *Lour. Fl. Cochinc.* 337.—*Rheede Hort. Mal.* ii. t. 51.—Probably Jussiæa diffusa, *Forsk. in Oliv. Fl. Trop. Afr.* ii. 488 *with many others.*

Throughout INDIA with CEYLON; very common.—DISTRIB. The warmer parts of the whole world.

Herbaceous, often creeping on the margins of tanks, the stems also spreading on the water and sustaining themselves on the surface by white vesicles ½–1½ in. *Leaves* very variable in size, ¼–3 in., usually glabrous sometimes hairy, upper usually 1–2 in., nearly always obtuse in the Indian examples. *Pedicel* usually as long as the capsule, sometimes quite short. *Petals* about ½ in., obovate. *Capsule* ½–1½ in., linear-cylindric, glabrous or with scattered hairs. *Seeds* smooth, reticulated.

2. **J. suffruticosa,** *Linn.*; *DC. Prodr.* iii. 58; erect, leaves lanceolate, petals 4 all yellow, capsule not woody, seeds subhemispheric, testa with a prominent raphe shining brown not corky. *Wall. Cat.* 6334; *Miq. Fl. Ind. Bat.* i. pt. i. 628; *Kurz in Journ. As. Soc.* 1877, pt. ii. 90. J. exaltata, *Roxb. Hort. Beng.* 33; *Fl. Ind.* ii. 401. J. villosa, *Lamk. Dict.* iii. 331; *DC. Prodr.* iii. 57; *Wall. Cat.* 6333; *W. & A. Prodr.* 336; *Gibs. & Dalz. Bomb. Fl.* 98. J. fruticosa, *DC. l. c.* J. scabra, *Willd.*; *DC. l. c.* J. Burmanni, and octophila, *DC. l. c.* J. longipes, *Griff. Notul.* iv. 689. J. decumbens, *Wall. Cat.* 6322. J. angustifolia, *Lamk. Dict.* iii. 331 *and Ill.* t. 280, fig. 3; *DC. Prodr.* iii. 55; *Miq. Fl. Ind. Bat.* i. pt. i. 627. Epilobium fruticosum, *Lour. Fl. Cochinc.* 226.—*Rheede Hort. Mal.* ii. t. 50.

In all INDIA except the western desert region; and in CEYLON.—DISTRIB. The warmer moist parts of the whole world.

Erect, branching, sometimes 4–6 ft. *Leaves* 3 by $\frac{3}{4}$ in., more or less villous (rarely in Indian examples subglabrous), sometimes short, ovate-lanceolate, sometimes nearly linear, shortly petioled or sessile. *Pedicel* very short, bracts inconspicuous, or (in var. *bracteata* of Rottler) foliaceous, 1 in. *Petals* $\frac{1}{4}$–$\frac{3}{8}$ in. *Capsule* 1–2 in., linear-cylindric, more or less villous or finally glabrous, 8-ribbed, membranous, breaking up between the ribs.—The form called *J. angustifolia* which has very narrow nearly glabrous leaves is found in Burma and thence to Australia, but there are no examples from Cis-Gangetic India.

3. LUDWIGIA, *Linn.*

Herbs. *Leaves* alternate, undivided, subentire. *Flowers* usually axillary, solitary, sessile or nearly so, peduncle 2-bracteate at its apex. *Calyx-tube* scarcely produced above the ovary, linear in the Indian species; teeth 3–5, acute, persistent. *Petals* 3–5 (or 0), epigynous. *Stamens* equal in number to the calyx-segments, epigynous. *Ovary* inferior, 4–5-celled; style simple, stigma capitate; ovules very many, attached in 2 or more vertical rows to the inner angle of each cell. *Capsule* linear or oblong (in the Indian species), 4–5-celled, opening by terminal pores or breaking up irregularly along the sides. *Seeds* numerous, obovoid, smooth, raphe obscure or prominent but not large, without coma.—DISTRIB. Species 20, mostly in North America; extending from the cool temperate zone to the equator; chiefly inhabiting marshes.

1. **L. parviflora,** *Roxb. Hort. Beng.* 11; *Fl. Ind.* i. 419; capsule $\frac{1}{3}$ by $\frac{1}{8}$–$\frac{1}{12}$ in. linear-oblong, seeds in many rows in each cell, raphe obscure. *DC. Prodr.* iii. 59; *Wight Ill.* t. 101; *W. & A. Prodr.* 336; *Dalz. & Gibs. Bomb. Fl.* 99; *Benth. Fl. Austral.* iii. 307; *Boiss. Fl. Orient.* ii. 752; *Kurz in Journ. As. Soc.* 1877, pt. ii. 91. L. lythroides, *Blume Bijd.* 1134; *DC. l. c.* D. jussiæoides, *Wall. Cat.* 6335 *not of Linn. and others.*

Throughout INDIA and CEYLON; common in rice fields and other moist places.—DISTRIB. Malaya. North Australia. Persia. Abyssinia.

Erect, 8–24 in., glabrous. *Leaves* 2–3 by $\frac{1}{2}$–$\frac{3}{4}$ in., lanceolate or linear-lanceolate, narrowed to the base. *Flowers* very shortly pedicelled, commonly 4-fid. *Petals* small, yellow. *Capsule* inflated, smooth, the seeds not separately distinguishable through its walls.

2. **L. prostrata,** *Roxb. Hort. Beng.* 11; *Fl. Ind.* i. 420; capsule $\frac{1}{2}$–$\frac{3}{4}$ by $\frac{1}{20}$ in. linear, seeds in one row in each cell, raphe narrow but prominent. *DC. Prodr.* iii. 59; *Wight Ic.* t. 762; *Kurz in Journ. As. Soc.* 1877, pt. ii. 91. L. diffusa, *Ham. in Trans. Linn. Soc.* xiv. 301 *Wall. Cat.* 6336. *DC. l. c.* L. fruticulosa, *Blume Bijd.* 1133; *DC. l. c.* Nematopyxis prostrata, pusilla, and fruticulosa, *Miq. Fl. Ind. Bat.* i. pt. i. 630.

NORTH-WEST INDIA; *Royle.* ASSAM. SILHET. RANGOON. CEYLON. Madras? *Heyne in Herb. Rottler.*—DISTRIB. Malaya, Japan.

Prostrate, or decumbent and then erect, 8–24 in., glabrous. *Leaves* 2–3 by $\frac{1}{3}$–$\frac{3}{4}$ in., lanceolate, narrowed to the base. *Flowers* sessile, 4-fid. *Capsule* not inflated, the walls drawn tightly over the seeds so that each seed can be counted from without.—This species of Roxburgh's was extricated by Mr. Bentham in *Fl. Austral.* iii. 308, where the synonymy is cleared up. Some of the Silhet examples however have some of the capsules very like those of *L. parviflora*, and others inflated for half their length like *L. parviflora*, and for the other half linear constricted like *L. prostrata.* The two species are identical except as to their capsules and seeds.

4. **CIRCÆA,** *Linn.*

Herbs. *Leaves* opposite, petioled, ovate, sinuate-dentate, membranous. *Flowers* small, white, pedicelled, in terminal and lateral peduncled racemes, finally lax; pedicels spreading, with minute subulate (or 0) bracts at their base. *Calyx-tube* ovoid, scarcely produced above the ovary, limb bipartite. *Petals* 2, obcordate, 2-lobed, epigynous. *Stamens* 2, epigynous. *Ovary* inferior, 1–2-celled; style filiform, stigma capitate almost 2-lobed; ovules attached to the inner angle of the cells, solitary or rarely 2 superimposed. *Fruit* small, pyriform, subcoriaceous, indehiscent, 1–2-celled. *Seeds* 1 in each cell, ellipsoid.—DISTRIB. Species 2 or 3, in subarctic and cool temperate regions of the northern hemisphere, extending southwards to the tropics on mountains.

1. **C. lutetiana,** *Linn.*; *DC. Prodr.* iii. 63; leaves ovate-lanceolate more or less pubescent not pellucid, fruit 2-seeded narrowed at the base patent-deflexed shorter than its pedicel covered with long hooked hairs. *Lamk. Ill.* t. 16, fig. 1; *Boiss. Fl. Orient.* ii. 753. C. repens, *Wall. Cat.* 6341.

TEMPERATE HIMALAYA from KUMAON to SIKKIM, alt. 7000–10,000 ft.; *Wallich, Major Madden, J. D. H., T. Thomson*; examples few.—DISTRIB. The northern hemisphere, extending south to near the tropic of Cancer.

Stems 1–2 ft., erect or decumbent at the base only, puberulous or pubescent. *Leaves* 2 by 1–1¼ in., long-petioled, rounded or narrowed at the base. *Bracts* 0. *Petals* white or pinkish. *Fruit* ⅛ in., obovoid, the hooked hairs usually longer than half the width of the fruit.—The *C. repens* of Wallich agrees closely with the European common type; the stem is decumbent for a short space at the base only.

2. **C. cordata,** *Royle Ill.* t. 43; leaves ovate-lanceolate cordate at the base more or less pubescent not pellucid, fruit 2-seeded broad-elliptic patent-deflexed little longer than broad from a broad rounded unequal base covered with long hooked hairs, not shorter than its pedicel.

WESTERN HIMALAYA; *Royle*; alt. 7000–8000 ft.; *T. Thomson*. KASHMIR, *C. B. Clarke*. SIMLA, *Jacquemont*; DALHOUSIE, Chumba, alt. 7000–9000 ft. plentiful, *C. B. Clarke*.—DISTRIB. Mandshuria, Japan.

Stems 1–2 ft., stouter and more hairy than of *E. lutetiana*, erect. *Leaves* 3½ by 2 in., sometimes larger; petiole often 1½ in. *Bracts* 0. *Petals* yellow (ex Royle) and appear so in the dried examples. *Fruit* scarcely ⅛ in., nearly or quite as much broad, the two carpels at the base generally descending unequally on the pedicel.

3. **C. alpina,** *Linn.*; *DC. Prodr.* iii. 63; leaves ovate glabrous or slightly pubescent often pellucid, fruit 1-seeded narrowed at the base shorter than its pedicel, glabrous or not densely hairy. *Lamk. Ill.* t. 16, fig. 2; *Wight Ill.* t. 101*; *Boiss. Fl. Orient.* ii. 753. C. intermedia, *Wall. Cat.* 6342.

TEMPERATE HIMALAYA, from KASHMIR to SIKKIM, alt. 7000–11,000 ft., not rare. KHASIA MTS., alt. 4500–6000 ft. NILGHIRIS and Pulney Mts., alt. 7000 ft.—DISTRIB. The Temperate Northern hemisphere.

Erect, 6–8 in., typically nearly glabrous. *Leaves* ¾ in., and about equally broad, long-petioled, rounded or cordate at the base, often deeply sinuate-toothed subangulose, glabrous or pubescent on the nerves. *Bracts* minute, subulate, sometimes obscure. *Petals* white. *Fruit* less than ⅛ in, obovoid, sometimes nearly glabrous, sometimes with many hooked hairs, but the hairs neither so many yellow nor long as commonly are those of *C. lutetiana*.

VAR. *himalaica*; stem taller 10–18 in., leaves much larger 1½ in. more pubescent not pellucid.—In the Himalaya only; the type of Wallich's *C. intermedia*. This plant has only one seed to the fruit and differs only in trivial characters from *C. alpina*.

5. **TRAPA,** *Linn.*

Floating herbs. *Leaves* dimorphic; submersed opposite, root-like, pinnatipartite, with filiform segments; emersed rosulate, rhomboidal, the petiole with a spongy dilatation near its apex. *Flowers* axillary, solitary, peduncled. *Calyx-tube* short, adnate to the lower part of the ovary; limb 4-partite, 2 or all the segments persistent and becoming spinescent on the fruit. *Petals* 4, white, small, inserted at the margin of an epigynous disc. *Stamens* 4. *Ovary* half-inferior, with a conical vertex, 2-celled; style subulate, stigma capitate; ovule solitary in each cell, pendulous from the upper inner angle. *Fruit* bony, 1-celled, large, obovoid, with 4 angles, 2 or all of which carry spines, indehiscent, with a short cylindric beak at the top through which the radicle is protruded. *Seed* 1, inverse, cotyledons very unequal.—DISTRIB. Species 2, extending through the warmer parts of the Old World, from Central Europe to China and to Tropical Africa.

1. **T. bispinosa,** *Roxb. Cor. Pl.* 234; *Hort. Beng.* 11; *Fl. Ind.* i. 428; leaves usually very villous beneath, fruit with 2 angles spinescent. *DC. Prodr.* iii. 64; *Wall. Cat.* 6339; *W. & A. Prodr.* 337; *Miq. Fl. Ind. Bat.* i. pt. i. 636; *Dalz. & Gibs. Bomb. Fl.* 99; *Kurz in Journ. As. Soc.* 1877, pt. ii. 91. T. quadrispinosa, *Wall. Cat.* 6340 *not Roxb.—Rheede Hort. Mal.* xi. t. 33.

Throughout INDIA and CEYLON.—DISTRIB. South-eastern Asia and Malaya; Tropical Africa.

In the Roxburghian type, floating leaves 2 by 2½–3 in., very villous beneath, posterior margin entire, anterior lightly crenate; petiole 4–6 in., woolly. *Fruit* ¾ in. long and broad, glabrous or hairy; two opposite angles each with an often retrorsely scabrous spine, the other two angles sometimes obsolete.—Very doubtfully distinct from the next species as Wallich has noted on his specimens.

VAR. *incisa, Wall.*; leaves much smaller about ¾ in. much less villous beneath incise serrate on the anterior margin.—Marked also *T. quadrispinosa* by Wallich; but though the leaves are the leaves of *T. natans*, the fruit is that of *T. bispinosa*.

2. **T. natans,** *Linn.*; *DC. Prodr.* iii. 63; leaves sparingly villous on the nerves beneath, fruit with all 4 angles carrying spines. *Lamk. Ill.* t. 75; *Boiss. Fl. Orient.* ii. 753. T. quadrispinosa, *Roxb. Hort. Beng.* 11; *Fl. Ind.* i. 451; *DC. l. c.*

KASHMIR; *Falconer, Jacquemont.* SILHET; *Roxburgh* (but no example thence at Kew).—DISTRIB. Persia to Central Europe and the Upper Nile.

Floating leaves 1 in., dentate or incise-dentate on the anterior margin; petiole 2–4 in., glabrescent. *Fruit* ¾ in. broad, the 4 angles all spinescent but the two lateral spines shorter.

ORDER LXIII. **SAMYDACEÆ.** (By C. B. Clarke, F.L.S.)

Trees or shrubs. *Leaves* alternate, often distichous, petioled occasionally subsessile, simple, entirely or lightly crenate or serrate, often closely punctulate beneath; stipules small, deciduous. *Flowers* regular, small, axillary, shortly pedicelled, densely fascicled or in long simple or panicled racemes. *Calyx* coriaceous, persistent; tube short, free, or longer and adnate to the ovary; limb 3–7-fid. *Petals* as many as the calyx-lobes (or 0), perigynous, imbricated. *Stamens* definite or indefinite, often with staminodes between or united in a tube with them. *Ovary* superior or half-superior, 1-celled; style 1, capitate or

3-fid at the apex, or styles 2–5; ovules many or several, placentas 2–5 (usually 3), parietal. *Fruit* loculicidally 2–5- (usually 3-) valved, valves carrying the seeds on their medial line. *Seeds* several (usually few sometimes many), oblong or angular, albuminous, usually drilled.—DISTRIB. Species 150, scattered through the tropical regions of the globe, rarely also in the subtropical.

Petals 0, flowers in axillary fascicles . . . . 1. CASEARIA.
Petals 0, racemes slender in a terminal panicle . . . . 2. OSMELIA.
Petals present, racemes axillary and terminal . . . . 3. HOMALIUM.

1. CASEARIA, *Jacq.*

Shrubs or small trees. *Leaves* alternate, distichous, petioled, undivided, entire or slightly serrate, often minutely punctate beneath; stipules small, lateral, caducous. *Flowers* small, greenish-yellow, clustered in the axils (in the Indian species); pedicels short, jointed above their base, surrounded by small scales. *Calyx* inferior, deeply 4–5-lobed; lobes imbricate, obtuse, persistent. *Petals* 0. *Stamens* double the number of calyx-lobes or thereabout, united in a tube with staminodes alternating with the free portion of the filaments; staminal tube hypogynous, sometimes very short so that the filaments are nearly or quite free. *Ovary* free, ovoid, 1-celled; style simple; stigma capitate or 3-fid; ovules many, parietal. *Capsule* succulent, globose or ovoid, ellipsoid (when dry somewhat 3-angular or 6-ribbed), 3- rarely 2-valved. *Seeds* many, angular or obovoid, with a fleshy usually coloured aril; embryo straight.—DISTRIB. Species 80, in the warmer parts of the whole globe, most plentiful in America.

* *Adult leaves and petioles glabrous.*

1. **C. glomerata,** *Roxb. Hort. Beng.* 33; *Fl. Ind.* ii. 419; leaves lanceolate or elliptic-lanceolate acuminate denticulate or crenate often obscurely and minutely so but never quite entire, acute or obtuse but not rounded cordate at the base, pedicels with minute yellow hair, fruit $\frac{1}{2}$ in., ellipsoid. *DC. Prodr.* ii. 49; *Benth. Fl. Hongk.* 122; *not of Kurz Flor. Fl.* i. 530. C. ovata, *Wall. Cat.* 7192 E, *not of Roxb.*

SIKKIM, BHOTAN and KHASIA, alt. 3000–5000 ft., common.—DISTRIB. Hong Kong (and probably Malaya, for the examples of *C. glabrata* Miq. collected in Sumatra appear *C. glomerata*).

A shrub, or in interior Sikkim a tree 20–30 ft.; branchlets somewhat angular, glabrous, not or but little lenticellate. *Leaves* commonly 4 by $1\frac{3}{4}$ in. (in Sikkim frequently 9 in.); petiole $\frac{1}{3}$ in. *Pedicels* usually very many, $\frac{1}{5}$ in. *Calyx* small, more or less pubescent in the bud. *Stamens* 7–10, staminodes yellow.—A plant collected in Sikkim by Mr. Kurz, marked "*C. glabra*," has bark densely uniformly lenticellate, petioles $\frac{1}{8}$–$\frac{1}{5}$ in. and the young buds and pedicels without the smaller yellow hairs; it can scarcely be Roxburgh's *C. glabra* from the Moluccas and which is not represented in the Kew Herbarium.

2. **C. leucolepis,** *Turcz. in Bull. Soc. Nat. Mosc.* 1858, pt. i. 463; leaves oblong acute crenulate base rounded unequal, pedicels with minute grey hairs. ? C. viridiflora *Lamk. Dict.* vi. 493.

SINGAPORE; *T. Lobb.*—DISTRIB. Java, Philippines.

Branchlets nearly glabrous. *Leaves* 5–6 by 2 in.; petiole $\frac{1}{2}$ in. *Pedicels* $\frac{1}{4}$ in.; buds minutely hairy, larger than those of *C. glomerata.*—There is a doubt whether Thos. Lobb's No. 468 on which Turczaninow founded the species was not collected at Luzon instead of Singapore. If so the species has not yet been found in British India.

Also, Turczaninow's description is not correct as to the absolute glabrousness of the species. The sepals and tips of the branchlets of Lobb No. 468 are minutely pubescent; and the examples of *C. angustata, Teys. & Binn.* (see *Miq. Fl. Ind. Bat.* i. pt. i. 710) only differ by being slightly more pubescent. Lastly, the whole does not differ from *C. glomerata* so much as *C. glomerata* if cultivated at Singapore might be expected to vary from the Sikkim type.

3. **C. graveolens,** *Dalz. in Hook. Journ. Bot.* iv. 107; leaves elliptic obtuse or shortly acute more or less crenate, base of the calyx pubescent, pedicel above the articulation glabrous, fruit ¾ in. ellipsoid. *Dalz. & Gibs. Bomb. Fl.* 11; *Brand. For. Fl.* 243. C. Hamiltoni, *Wall. Cat.* 7195 *chiefly.* C. macrogyna, *Turcz. in Bull. Soc. Nat. Mosc.* 1858, pt. i. 463; *Kurz in Journ. As. Soc.* 1877, pt. ii. 92; *For. Fl.* i. 529.

GURWHAL and KUMAON; *Royle, Wallich, &c.* SIKKIM; alt. 1500 ft., *C. B. Clarke.* DECCAN PENINSULA, especially the western side, common; *Wight,* &c. BURMA; *McClelland, Kurz.*

A shrub, or tree 20 ft.; branchlets glabrous to the final stipules. *Leaves* (in the type) 4 by 2¾ in., broadly elliptic, little acuminate, rounded at the base; petiole ¼ in.; but the leaves are often narrower, almost lanceolate, and acute at the base. *Pedicels* usually short, sometimes ¼ in., jointed at or above the base, aureo-pubescent below the articulation glabrous above to near the base of the calyx. *Calyx* always pubescent at the base, above sometimes densely aureo-pubescent sometimes glabrous.—This species is to be separated from *C. glomerata* by the pedicel glabrous above its articulation and by its geographic locality; from *C. esculenta* by its less entire less thick leaves and the calyx pubescent at its base. As to the Wallichian Number quoted: in the large paper type, *Wall. Cat.* 7195, A and one sheet of B is *C. graveolens*; the other part of B does not belong to the genus. The Burmese plant is distributed by Mr. Kurz under the name *C. Hamiltoni,* Wall. correctly: but in *Journ. As. Soc.* and *For. Fl.* he has changed the name to *C. Canziala,* Wall. (see 10. *C. tomentosa.*) Now Roxburgh says his *C. ovata* has the leaves downy beneath, whereas Mr. Kurz says (truly) that his plant has all parts glabrous: Wallich's own *Canziala* is hairy.

4. **C. esculenta,** *Roxb. Fl. Ind.* ii. 422; leaves elliptic-lanceolate entire acute at the base or at least not rounded, pedicel above its articulation and calyx glabrous, fruit ½–¾ in. ellipsoid. C. lævigata, *Dalz. in Hook. Journ. Bot.* iv. 107; *Dalz. & Gibs. Bomb. Fl.* 11. C. Championii and zeylanica, *Thwaites Enum.* p. 19. C. varians, *Thwaites Enum.* 19 *at least as regards var. a*; *Bedd. Fl. Sylv.* t. 208.

MALABAR, from BOMBAY to KURG, frequent. CEYLON, plentiful; *Thwaites.* MOULMEIN and SINGAPORE, *Lobb. Griffith, Maingay.*

A shrub or small tree, branches glabrous. *Leaves* 3–6 by 1–2 in., broad-lanceolate, narrowed to both ends, entire or most obscurely crenate, thick, subcoriaceous; petiole ¼–½ in. *Pedicels* short, usually less than ¼ in. in fruit, jointed at the base. *Carpels* 2, with 2-fid stigma (Thwaites No. 2604, 2657); but carpels often 3 (see *Beddome Fl. Sylv.* 208).—*C. Championii Thwaites* with very entire coriaceous acuminated leaves is exactly the form sent from Moulmein and Singapore.

VAR. *angusta*; leaves narrow-lanceolar 4 by 1 in.—Ceylon; *Thwaites* No. 2603 reduced with hesitation to *C. esculenta* by Mr. Bentham in *Fl. Austral.* iii. 309.

5. **C. coriacea,** *Thwaites Enum.* 20; leaves obovate obtuse or rounded at the vertex entire, pedicel above its articulation and calyx glabrous, fruit ½–¾ in. ellipsoid. *C. varians var. γ obovata Thwaites l. c.*

CEYLON, alt. 6000–8000 ft.; *Thwaites, Gardner, Walker.*

A small tree, branches glabrous. *Leaves* 2 in., much narrowed at the base; petiole ⅕ in. *Carpels* always 2 (*Thwaites*).

6. **C. rubescens,** *Dalz. in Hook. Journ. Bot.* iv. 108; leaves elliptic-lanceolate entire acute or obtuse base not rounded, pedicels minutely pubescent, fruit $\frac{3}{4}$ in. and upwards ellipsoid. *Dalz. & Gibs. Bomb. Fl.* 11.

BOMBAY GHAUTS, CONCAN and KURG; *Dalzell, Stocks, Ritchie.*

A shrub 4–6 ft. (Dalzell); branches glabrous to the final stipules. *Leaves* $4\frac{1}{2}$ by $2\frac{1}{4}$ in., acuminated, coriaceous often ruddy (but not more so than some examples of *C. esculenta*); petiole $\frac{1}{4}$ in. *Pedicels* short, usually less than $\frac{1}{5}$ in., jointed at the base. *Calyx-lobes* broad, minutely pubescent.—This species is here distinguished from *C. esculenta* solely by the minute pubescence of the pedicels.

7. **C. macrocarpa,** *C. B. Clarke*; leaves narrowly lanceolate, pedicels glabrous, fruit $1\frac{3}{4}$ by $\frac{5}{8}$ in.

PINANG; *Maingay* 660–2.

Branchlets reddish, glabrous. *Leaves* 5 by $1\frac{1}{4}$ in., entire, acute at both ends, reddish, reticulate, shining; petiole $\frac{1}{4}$ in. *Pedicels* few, not exceeding $\frac{1}{5}$ in., glabrous, reddish, buds glabrous. *Seeds* $\frac{1}{4}$ in., obovoid, compressed.

8. **C. albicans,** *Wall. Cat.* 7197; leaves oblong acute at both ends, pedicels glabrous, fruit 2 by $1\frac{1}{8}$ in. ovoid bright yellow when ripe (*Maingay*).

PINANG; *Wallich.* MALACCA; *Maingay*, No. 660.

Branchlets thick, glabrous, striate. *Leaves* 9 by $2\frac{3}{4}$ in., entire, coriaceous, nerves much raised beneath; petiole $\frac{3}{8}$ in. *Pedicels* clustered, $\frac{1}{4}$ in., buds glabrous.—It is possible that this species may prove a variety of the preceding, but the leaves are much broader, the fruit ovoid (instead of narrowly ellipsoid) as noted by Dr. Maingay.

** *Adult leaves on the midrib beneath together with the petiole more or less pubescent.*

9. **C. Vareca,** *Roxb. Hort. Beng.* 33; *Fl. Ind.* ii. 418; leaves oblong closely serrate softly hairy beneath, pedicels above the articulation glabrous, fruit $\frac{1}{3}$ in. broadly ellipsoid yellow or pinkish yellow. *Wall. Cat.* 7194; *Kurz For. Fl.* i. 530.

TERAI of the Himalaya from SIKKIM eastward and of KHASIA, at 500–3000 ft. elevation, plentiful.—DISTRIB. Ava.

A shrub, branchlets pubescent. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ in., often somewhat obovate, obtuse suddenly narrowed but sometimes acuminate; petiole $\frac{1}{4}$ in. *Pedicels* less than $\frac{1}{4}$ in., usually jointed far above the base, very hairy below the articulation. *Staminal* tube elongate, stamens often 10. *Seeds* in bright red pulp.—The leaves have regularly and closely placed serrations which prominently mark this species from all others and appear to have completely protected it against synonyms.

10. **C. tomentosa,** *Roxb. Fl. Ind.* ii. 421; leaves elliptic-oblong or lanceolate entire or crenate not acuminate base acute or rounded, pedicels and calyx hairy, fruit $\frac{1}{2}$–$\frac{3}{4}$ in. broad-ellipsoid. *Wall. Cat.* 7191; *Brand. For. Fl.* 243, t. 31. C. Anavinga, *Dalz. & Gibs. Bomb. Fl.* 11. C. ovata, *Roxb. Fl. Ind.* ii. 420 (*not of Willd.*); *Wall. Cat.* 7192 excl. E. C. Canziala, *Ham. in Wall. Cat.* 7192; *Voigt Hort. Sub. Calc.* 78; *Kurz in Flora* 1871, 294. C. elliptica, *Willd. Sp. Pl.* ii. 628; *DC. Prod.* ii. 51; *Wight Ic.* t. 1849; *Wall. Cat.* 7193; *Blume Mus. Bot.* i. 253; *Miq. Fl. Ind. Bat.* i. pt. i. 709. C. glabra, *Hort. Calc. in Herb. Wall. and Herb. Heyne.* C. Dallichii, *F. Muell.*; *Benth. Fl. Austral.* iii. 309. Samyda piscidia, *Ham. in Wall. Cat.* 7193 D?—*Rheede Hort. Mal.* v. 50.

Throughout INDIA and CEYLON, common.—DISTRIB. Malaya and North Australia.

A shrub, or tree attaining 25 ft.; branchlets tomentose pubescent or nearly glabrous. *Leaves* 4 by 1½ in., tomentose beneath or pubescent or only slightly hairy about the base of the midrib, rarely so closely serrate as in *Wight Ic.* t. 1849, often nearly entire; petiole variable from ⅛–⅜ to 6 in. in Central India examples. *Pedicels* usually numerous, less than ¼ in.; buds usually hairy, sometimes nearly glabrous. *Staminal* tube short, stamens 7–10 (sometimes 12 Benth.). *Seeds* in red pulp.—The typical *C. tomentosa* of North-West India has softly villous oblong nearly entire leaves; the South Indian examples (var. *elliptica*) have the leaves more glabrous, more crenate-serrate and more narrowed at base. With these the Malayan examples agree. As to *C. Canziala, Wall. Cat.* 7192 stated by Wall. to be equivalent to *C. ovata* Roxb. the numerous examples of Wight and Wallich have the pedicels buds and leaves beneath villous and if it is separable as a species it is certainly not *C. graveolens.* Willdenow says his *C. elliptica* has glabrous leaves and Roxburgh says his *C. glabra* has glabrous leaves; so that these synonyms as known only from description must be excluded. But it is very probable that they relate to the nearly glabrous form *C. Dallachii* (see *Benth. Fl. Austral.* iii. 309).

11. **C. Lobbiana,** *Turcz. in Bull. Soc. Nat. Mosc.* 1858, pt. i. p. 463; leaves oblong-lanceolate acuminate entire softly hairy beneath, flowers almost sessile, fruit less than ¼ in. diam. nearly globose.

MOULMEIN and SINGAPORE, *T. Lobb*; MALACCA, *Griffith.*

Branchlets round, softly hairy. *Leaves* 2½–3½ by ¾–1¼ in.; petiole ⅛–⅕ in. *Buds* most minutely pubescent. *Fruit* subsessile.— Scarcely differs from *C. tomentosa* but by the more acuminate leaves.

12. **C. grewiæfolia,** *Vent. Choix.* 48; leaves large oblong hairy beneath entire or crenulate base rounded or cordate, pedicels pubescent, fruit ¾–1 in. *DC. Prodr.* ii. 51; *Miq. Fl. Ind. Bat.* i. pt. i. 706. C. variabilis, *Blume Mus. Bot.* i. 252. C. subcuneata, *Miq. l. c.* C. cinerea, *Turcz. in Bull. Soc. Nat. Mosc.* 1858, pt. i. 462.

MALACCA, *Maingay* No. 659, 661.—DISTRIB. Malaya to the Philippines.

A small tree (Maingay), branchlets more or less pubescent. *Leaves* 7 by 2½ in.; petiole ⅕ in. *Pedicels* often ¼ in., jointed at the base, buds generally pubescent.—Differs little from *C. tomentosa* but by the cordate base of the leaves as Ventenat mentions. Miquel says his *C. subcuneata* differs from the typical *C. grewiæfolia* in being less hairy; but in Miquel's own communicated examples there is hardly any difference even in this respect.

13. **C. wynadensis,** *Bedd. Ic. Pl. Ind. Or.* t. 160; leaves elliptic-lanceolate acuminate denticulate-serrate pubescent beneath narrowed into the petiole, pedicels pubescent.

WYNAAD; alt. 2000–3000 ft.; *Beddome.*

A small tree (Beddome), branchlets aureo-villous. *Leaves* 4–6 by 1¼–2 in.; petiole ¼–⅜ in. *Pedicels* not very many together, ⅕ in. or less; buds minutely pubescent. *Stigma* 4-lobed (Beddome).—Differs considerably from *C. tomentosa* among other things by the leaves being acuminated to a very sharp point.

14. **C. Kurzii,** *C. B. Clarke*; leaves lanceolate or oblong-lanceolate narrowed at the base with spreading yellow hairs beneath crenate or nearly entire, pedicels pubescent very long, fruit ellipsoid (¾ in. ?). C. glomerata var. puberula, *Kurz in Journ. As. Soc.* 1877, pt. ii. 92; *For. Fl.* i. 530.

CHITTAGONG; *H. f. & T.*—DISTRIB. Northern Burma.

Branchlets minutely pubescent. *Leaves* 5 by 2 in.: petiole nearly ⅓ in. *Pedicels* not very many together, ¼–½ in. *Calyx* minutely pubescent. *Fruit* not ripe but

cannot become very large.—The pedicels are much longer in this species than in any of the others; and the pubescence of the leaves beneath differs from all except that of *C. grewiæfolia.* A *Casearia* collected by Griffith in fruit in Assam may be this, but the pedicels are shorter, and some of the leaves rounded at the base, approaching thus *C. grewiæfolia.*

IMPERFECTLY KNOWN AND EXCLUDED SPECIES.

C. ASTYLA, *Turcz. in Bull. Soc. Imp. Mosc.* 1863, 608; branchlets pubescent, leaves glabrous, sterile stamens densely white-hirsute, style 0.

EAST INDIES; *Roxburgh* (*fide Turcz.*).

Leaves lanceolate, somewhat long but obtusely acuminate, margin revolute entire, shining, not punctate; petiole short. *Pedicels* 3 or few. *Calyx-tube* top-shaped, contracted in the middle, segments reflexed.—A very distinct species in the structure of its flowers, forming the type of a separate subgenus.—Not seen; the foregoing is taken from Turczaninow.

CASEARIA ? CORIACEA, *Wall. Cat.* 7196, is *Chætocarpus castanocarpus*, Thwaites Enum. 275.

CASEARIA ? ACUMINATA, *Wall. Cat.* 7198, has opposite leaves and is remote from the genus and order.

CASEARIA ? LUCIDA, *Wall. Cat.* 7199, is a Euphorbiaceous plant, possibly the male of *Wall. Cat.* 7196.

2. OSMELIA, *Thwaites.*

Trees. *Leaves* alternate, petioled, ovate or oblong-lanceolate, entire or obscurely serrate, epunctate; stipules minute, deciduous. *Flowers* small, very nearly sessile, in long racemes which are simple or panicled. *Calyx* inferior, divided nearly to the base; lobes 5, rounded, imbricate. *Petals* 0. *Stamens* 10 (or 8), 5 alternating with as many 2-lobed hairy scales and 5 inserted in the notches of those scales. *Ovary* superior, 1-celled; styles 3, short, with capitellate stigmas; ovules few, placentas 3, parietal. *Capsule* subglobose, 3-valved. *Seeds* few, subglobose, with red fleshy aril.—DISTRIB. Species 3; one in Ceylon, two in the Philippines.

1. **O. zeylanica,** *Thwaites Enum.* 20; leaves glabrous narrow elliptic-lanceolate acuminate nearly entire, panicle terminal. *Benth. in Journ. Linn. Soc.* v. *Suppl.* 89; *Bedd. Fl. Sylv.* t. 209. Casearia paniculata, *Gardn.*

CEYLON; *Gardner*; Central Province, alt. 3000 ft., not common; *Thwaites.*

Younger branches and panicle pubescent. *Leaves* 2–4 by 1–1½ in., narrowed at the base; petiole ⅕ in. *Panicle* lax, racemes 4–6 in. *Flowers* white tinged with red, each supported by a single cup-shaped bract. *Stamens* 10. *Ovary* very hairy. *Capsule* ⅜ in., coriaceous. *Seeds* 1–4, subglobose.

3. HOMALIUM, *Jacq.*

Shrubs or trees. *Leaves* alternate, crenate or subentire, petioled or sessile, rarely punctulate. *Flowers* hairy, small, in slender axillary and sub-terminal simple or panicled racemes; bract at the base of the pedicel often prominent but caducous. *Calyx-tube* funnel-shaped, adnate to the base of the ovary; lobes 5–7, narrow, persistent. *Petals* 5–7, inserted in the throat of the calyx, linear-oblong, persistent. *Disk* tomentose. *Stamens* solitary or in fascicles of 1–7, opposite the petals with alternating glands. *Ovary* half-superior, 1-celled;

styles 2–5, filiform, stigmas capitellate; ovules many or several, placentas parietal, extending only down the upper free portion of the ovary *Capsule* half-superior, coriaceous, 2–5-valved at the apex. *Seeds* few, angular or oblong. —DISTRIB. Species 30, scattered over the hot regions of nearly the whole globe.

As no one of the Indian specimens exhibits fruit, the description of the capsule and seeds in the above diagnosis has been assumed to apply to the Indian species.

SECT. I. **Blackwellia.** *Stamens* 1 opposite each petal.

* *Racemes panicled.*

1. **H. nepalense,** *Benth. in Journ. Linn. Soc.* iv. 34; leaves ovate or elliptic subacute petioled crenate glabrous, panicles with divaricate branches minutely tomentose or nearly glabrous. Blackwellia nepalensis, *Wall. Pl. As. Rar.* t. 179; *Wall. Cat.* 4900; *DC. Prodr.* ii. 54. B. (Astranthus) acuminata, *Wall. in Herb.*

NIPAL; *Wallich.*
Leaves 4¼ by 2½ in., subacute obtuse or scarcely rounded at the base; petiole ⅓ in. *Panicles* 3–4 in. long and broad, axillary. *Flowers* small, short-pedicelled, 6–7-fid.

** *Racemes elongate simple.*

2. **H. tomentosum,** *Benth. in Journ. Linn. Soc.* iv. 34; leaves nearly sessile obovate repand-crenate pubescent or tomentose beneath, flowers clustered subsessile. *Kurz For. Fl.* i. 531. Blackwellia tomentosa, *Vent. Choix* t. 57; *DC. Prodr.* ii. 55; *Miq. Fl. Ind. Bat.* i. pt. i. 714. B. spiralis, *Wall. Cat.* 4897, *partly*; *DC. l. c.*

PEGU; *Wallich, Kurz.*—DISTRIB. Java.
Leaves 5 by 3 in., narrowed or scarcely rounded at the base; petiole ⅛ in. or less. *Racemes* 6 in., axillary, scattered, tomentose. *Flowers* small, 5–6-fid. *Calyx-tube* not elongated, segments about equalling the petals.

3. **H. longifolium,** *Benth. in Journ. Linn. Soc.* 35 (*excl. syn.*) leaves petioled oblong or oblong-lanceolate not rounded at the base entire or nearly so glabrous, flowers clustered pedicelled, calyx-tube short segments nearly as long as the petals. Blackwellia macrostachya, *Turcz. in Bull. Soc. Imp. Mosc.* 1863, 610 *ex descr.*

PINANG; *Phillips.* MALAYA; *Maingay* No. 665.
Tree not very large but high (Maingay). *Leaves* 4–7 by 1¼–2¼ in.; petiole ¼ in. *Racemes* 6 in., axillary, scattered, but mostly towards the ends of the branchlets, tomentose or scarcely more than puberulous; pedicels short, usually less than ⅛ in. *Flowers* small, 6–8-fid.—For the synonym *Wall. Cat.* 4897 *in part* adduced by Mr. Bentham see *H. propinquum* below.

4. **H. minutiflorum,** *Kurz For. Fl.* i. 532; glabrous, leaves petioled oblong coarsely crenate, pedicels glabrous, flowers minute about $\frac{1}{24}$ in. long.

BURMA, probably Martaban or Tenasserim; *Brandis.*
An evergreen tree. *Leaves* 3–5 in., obtusely apiculate, thin, coriaceous; petiole ¼–⅓ in., stout. *Racemes* glabrous, simple or slightly branched, in pairs or solitary, axillary. *Calyx* glabrous; segments oblong-linear, villous-ciliate. *Filaments* slender, one before each petal.—Not seen: description copied from Mr. Kurz.

5. **H. zeylanicum,** *Benth. in Journ. Linn. Soc.* iv. 35; leaves petioled elliptic narrowed at both ends crenate glabrous, flowers clustered pedicelled,

calyx-tube oblong top-shaped segments shorter than the petals. *Bedd. Fl. Sylv.* t. 210. Blackwellia zeylanica, *Gardn. in Calc. Journ. Nat. Hist.* vii. 452. B. tetrandra, *Wight Ic.* t. 1851.

MALABAR, up to 4000 ft., not uncommon; *Law, Stocks,* &c. CEYLON, moister parts up to 3000 ft.; *Walker,* &c.

A tree 40–50 ft. *Leaves* 4 by 2 in., obtusely acuminate; petiole ⅜ in. *Racemes* axillary, scattered, also approximated at the ends of the branches, often dense with flowers; pedicels short, usually about ⅛ in. *Flowers* small (but varying considerably in size), 4–6-fid. *Styles* 3–4.

SECT. II. **Racoubea.** *Stamens* 2–7 opposite or subopposite each petal: some of the filaments sometimes having no anthers.

* *Racemes panicled or more or less divided.*

6. **H. Schlichii,** *Kurz For. Fl.* i. 532; leaves petioled elliptic narrowed at both ends coarsely crenate glabrous, racemes terminal or subterminal, panicled grey-pubescent, stamens 3 before each petal.

CHITTAGONG, in tropical forests; *Kurz.*

7. **H. propinquum,** *C. B. Clarke*; leaves petioled oblong undulate-crenate pubescent on the midrib beneath, racemes often simple, flowers clustered pedicelled, calyx-tube oblong top-shaped segments nearly as long as the petals. H. longifolium, *in part Benth. in Journ. Linn. Soc.* iv. 35. Blackwellia propinqua, *Wall. Cat.* 4898. B. spiralis, *Wall. Cat.* 4897 A.

PEGU; *Wallich.*

Leaves 4–8 by 1½–3 in., obtuse, base usually narrowed sometimes unequally rounded; petiole scarcely ¼ in., villous. *Racemes* 6 in., towards the ends of the branches, villous-tomentose, simple or branched once; pedicels about ⅛ in. *Flowers* small, 6-fid. *Stamens* 2 before each petal, both bearing anthers.

** *Racemes elongate, simple.*

8. **H. Griffithianum,** *Kurz in Journ. As. Soc.* 1877, pt. ii. 93; *For. Fl.* i. 531, *character emended and all syn. excl.*; leaves short-petioled elliptic-rounded subcordate at the base pubescent on the nerves above aureo-villous beneath crenate, flowers clustered very short-pedicelled 8–10-fid, calyx-tube very short. H. fœtidum, *Benth. in Journ. Linn. Soc.* iv. 37 *partly, not of others.* Blackwellia dasyantha, *Turcz. in Bull. Soc. Imp. Mosc.* 1863, 610. Blackwellia *sp. Griff. Notul.* iv. 584.

MERGUI, *Griffith* No. 991. TENASSERIM, *Helfer.*

Branchlets with spreading yellow hairs. *Leaves* 3 by 2 in., not much acuminate, above densely yellow villous-pubescent on the nerves with scattered hairs on the surface especially near the margin; long golden spreading hairs on the midrib beneath, and bundles of similar hairs in the axils of the nerves; petiole scarcely ⅕ in., densely villous. *Racemes* 6 in., tomentose; pedicels very short, less than ⅛ in. *Flowers* small, but larger and much more hairy than those of *H. fœtidum.* *Calyx-segments* shorter than the petals. *Styles* 5.—Griffith states in Notul. that his plant has two stamens before each petal, as his specimens clearly show: it is by oversight that Mr. Kurz has described one only.

9. **H. fœtidum,** *Benth. in Journ. Linn. Soc.* iv. 37; leaves petioled elliptic narrowed at both ends glabrous crenate, flowers clustered pedicelled 6–8-fid, calyx-tube short segments a little shorter than the petals. Blackwellia fœtida,

Wall. Cat. 4899; *Deless. Ic. Sel.* iii. 53; *Miq. Fl. Ind. Bat.* i. pt. i. 714. Astranthus fœtida, *Wall. in Herb.* Ludia fœtida, *Roxb. Fl. Ind.* ii. 508 *ex Wallich.*

MALACCA; *Griffith, Maingay* No. 664.—DISTRIB. Malaya.

A tree, branchlets leaves and petioles glabrous. *Leaves* 4–7 by 1½–3½ in., base narrowed; petiole ¼–½ in. *Racemes* 6 in., minutely tomentose or glabrous; pedicels short, often ⅛ in. *Stamens* 2 or 3 before each petal. *Ovary* densely villous. *Styles* 3–4 (5 ex Maingay). *Fruit* 1-seeded according to a note of Maingay.

10. **H. grandiflorum,** *Benth. in Journ. Linn. Soc.* iv. 37; leaves short-petioled elliptic-oblong entire coriaceous glabrous, flowers pedicelled solitary 6–7-fid, calyx-tube short, segments enlarged after flowering and longer than the petals, stamens about 7 to each petal.

MALACCA; *Griffith.*—DISTRIB. Sumatra.

Leaves 6 by 2½ in.; petiole hardly ¼ in. *Racemes* 6 in., puberulo-pubescent or tomentose, pedicels about ⅛ in. *Flowers* large, calyx-segments after flowering ⅜ in. *Ovary* even in flower with the apex much elevated. *Styles* 5.

11. **H. travancoricum,** *Bedd. Fl. Sylv.* t. 211; leaves petioled elliptic crenate glabrous, flowers subsessile clustered usually 5-fid, calyx-tube short turbinate segments hardly half the length of the petals, stamens 3–4 opposite each petal.

SOUTH MALABAR MTS.; Travancore and Tinnivelly Ghauts; *Beddome.*

A handsome middle-sized tree (Beddome). *Leaves* 3–4 by 1⅓–1¾ in., obtuse acute or acuminate, base subacute or obtuse hardly rounded; petiole less than ¼ in. *Racemes* 2–4 in., axillary, puberulo-pubescent, not so dense-flowered as in *H. zeylanicum* (ex Beddome); but the flowers appear as dense as in other species.

DOUBTFUL SPECIES.

H. FŒTIDUM, *Kurz For. Fl.* i. 532 *not of others*; all parts quite glabrous, leaves broadly-oblong coarsely crenate, stamens in pairs opposite the petals, ovary glabrous.

TENASSERIM, *Kurz.*

The ovary is densely villous in all the Kew *H. fœtidum.*

ORDER LXIV. **PASSIFLOREÆ.** (By M. T. Masters.)

Twining herbs or shrubs, rarely erect. *Leaves* alternate, stipulate, simple or lobed, penni- or palmi-nerved, frequently glandular beneath. *Petiole* usually provided with glands. *Stipules* foliaceous or minute. *Tendrils* axillary or 0. *Inflorescence* axillary, cymose, sometimes with one or more branches cirrose, rarely flowers solitary. *Bracteoles* 3, minute and scattered, or foliaceous and forming an epicalyx, rarely 0. *Flowers* regular, unisexual or bisexual. *Calyx* tubular at the base, fleshy, subcoriaceous or membranous; segments imbricate, 5. *Petals* 0 or as many as the calyx-lobes, springing from the tube of the calyx, membranous or fleshy, imbricate, marcescent. *Corona* of one or more rows, filamentous or membranous or both, arising from various portions of the calyx-tube, rarely 0; basilar corona urceolate or cup-shaped, surrounding the base of the andrœcium, sometimes represented by five separate glands of the disc; rarely 0. *Stamens* 5, on a gynophore or free at the base, perigynous; anthers oblong, 2-celled, basi- or dorsi-fixed, dehiscing laterally or introrsely. *Ovary* superior, on a gynophore or subsessile, 1-celled with 3 parietal placentas, rudimentary or absent in the male flowers. *Styles* 1 or 3; stigmas reniform,

capitate or flattened. *Ovules* numerous, pendulous, anatropous; funicle expanded into a cup-shaped arillus. *Fruit* baccate or capsular. *Seeds* numerous, ovoid or flattened, often pitted, covered with a fleshy arillus, albumen fleshy, rarely scanty; embryo straight, cotyledons flat leafy, radicle short terete.—DISTRIB. Chiefly tropical; most numerous in South America. Genera about 20; species about 300.

Carica Papaya, L. The Papaw is commonly cultivated, and is more or less naturalized in various parts of India.

TRIBE I. **Passifloreæ.** *Flowers* hermaphrodite. *Stamens* hypogynous.

Twining herbs or shrubs . . . . 1. PASSIFLORA.
Erect shrubs . . . . 2. PAROPSIA.

TRIBE II. **Modecceæ.** *Flowers* unisexual. *Stamens* perigynous.

3. MODECCA.

1. PASSIFLORA, *Linn.*

Twining shrubs. *Leaves* simple or palmilobed, usually with glands on the under surface and on the petiole; stipules thread-like or leafy. *Flowers* pedunculate; peduncles simple or cymose. *Bracteoles* 3, small, scattered. *Calyx-tube* fleshy, limb 5-lobed. *Petals* 5, springing from the throat of the calyx. *Corona* of one or more rows of fine threads springing from the throat of the calyx-tube and of one or more membranous folds arising lower down. *Gynophore* surrounded at the base by a shallow membranous cup or basilar corona; filaments 5, flat; anthers oblong, 2-celled, dorsifixed; pollen grains reticulate on the surface. *Ovary* 1-celled; styles 3, stigmas reniformi-capitate. *Fruit* baccate. *Seeds* arillate.—DISTRIB. A large genus most abundant in tropical and subtropical America. A few are Malayan and two Chinese.

In addition to the following species, several others are cultivated in Indian gardens, and some have become more or less naturalized, as indeed in all hotter countries. Among these may be mentioned varieties of *P. fœtida* and *suberosa*. A form of the latter species was described by Wight as indigenous to Ceylon under the name of *P. Walkeriæ*, 39 Ill. ii. (t. 108), but there is no reason to suppose it indigenous.

1. **P. Leschenaultii,** *DC. Prodr.* iii. 326; leaves semiorbicular truncate palminerved shortly 3-lobed glandless pubescent especially beneath. *Wall. Cat.* 1231; *W. & A. Prodr.* 352; *Hook. Ic. Pl.* t. 353; *Wight Ic.* t. 39.

KHASIA, PULNEY and NILGHIRI MTS.

A climbing shrub. *Branches* slender, angular. *Leaves* broader than long, more or less pubescent, especially on the under surface and along the 3 nerves, rarely entirely glabrous, base rounded or cordate, apex truncately 3-lobed, lateral lobes spreading lanceolate, central lobe very small; petiole 1 in., with 2 sessile glands below the middle. *Peduncles* in pairs in the axils of the leaves, simple, longer than the petiole; bracteoles 3, remote, linear. *Flowers* 2 in. diam.; tube short, saucer-shaped. *Sepals* oblong, obtuse. *Petals* white, equalling the sepals in length but narrower. *Outer corona* near the base of the tube, of two rows of linear filaments, the outer rather shorter than the petals, the inner much shorter; *inner corona* short, tubular, membranous, plicated, margin incurved and crisped; *basilar corona* small, cup-shaped, surrounding the base of the gynophore. *Anthers* linear. *Ovary* elongate-oblong. *Fruit* $1\frac{1}{2}$ by 1 in., ovoid, glabrous, yellowish; rind leathery.

2. **P. nepalensis,** *Wall. Tent. Fl. Nep.* 20, t. 11; *Cat.* 1230; leaves ovate or ovate-lanceolate entire glaucous beneath. *Griffith Itin. notes,* 24; *Ic. Pl. Asiat.* t. 605, fig. 4. P. geminiflora, *Don Prodr.* 63.

NIPAL, *Wallich.* SIKKIM, alt. 4–6000 ft. KHASIA MTS., alt. 3–6000 ft., *H. f. & T.*
A glabrous climber with slender angular branches and distant leaves. *Stipules* ⅓ in., linear-subulate. *Leaves* 2½–4 by 2–3 in., thin, membranous, deep green above, glaucescent beneath, marked near the base with 2–3 flat circular glands, rounded or cordate at the base, apiculate, 1- or sub-3-nerved, nerves prominent, smaller nerves arched, remote, inconspicuous; petiole ½ in., usually with two glands above the middle. *Peduncles* simple, in pairs in the axils of the leaves, about half the length of the petiole, slender, 1-flowered, jointed above the middle, rarely cymose; cymes lax, few-flowered. *Flowers* less than ½ in. diam., cup-shaped; tube short, cylindrical. *Calyx-lobes* longer than the tube. *Petals* equal to the calyx-lobes. *Corona* of many rows of short threads. *Gynophore* shorter than the flower. *Ovary* ovoid or subglobose, glabrous. *Fruit* subglobose, the size of a large pea, purplish.

EXCLUDED SPECIES.

P. CALONEURA, *Kurz in Journ. As. Soc.* 1877, ii. 95, described as from "Burma probably Upper Tenasserim or Martaban, *Brandis,*" is, according to an authentic specimen sent by Dr. Kurz from the Calcutta Herbarium, the *Aristolochia trilobata.* L., of the West Indies and South America, no doubt introduced into India; it is not in flower or fruit, but the nervation of the leaf, no less than its form and indumentum, leaves no doubt as to this identification.

P. HEYNEANA, *Wall. Cat.* 1233 *bis* (*alias* 2248) is an *Olacinea,* probably referable to *Erythropalum populifolium,* Mast.

2. PAROPSIA, *Noronh.*

Shrubs. *Leaves* simple. *Flowers* in dense axillary cymes. *Calyx-tube* short; limb 5-parted. *Petals* 5, springing from the base of the calyx-tube. *Corona* of fine threads springing from the tube of the calyx and more or less divided into five antipetalous phalanges. *Gynophore* short; filaments flat; anthers oblong. *Ovary* subglobose. *Style* short dividing into three branches; stigmas reniformi-capitate. *Fruit* capsular.—DISTRIB. 4 or 5 species, natives of tropical Africa and Malaya.

1. **P. malayana,** *Planch.*; *Mast. in Trans. Linn. Soc.* xxvii. 639; leaves oblong finely serrated with a long abrupt acumen, calyx-tube campanulate, ovary globose.

MALACCA, *Maingay, Griffith.*
A shrub. *Leaves* 3½ by 1 in.; petiole ⅛ in. *Flowers* ½ in. in diam. *Calyx* campanulate, tube short covered with tawny down; lobes oblong, obtuse, 4 or 5 times longer than the tube. *Petals* oblong, 1-nerved, half the length of the sepals. *Corona* of a single row of flat, villose threads, half the length of the petals and arising with them from the margin of the tube. *Gynophore* shorter than the petals. *Stamens* 5, filaments filiform; anthers oblong. *Ovary* globose, villose. *Stigmas* large, capitate-reniform.

2. **P. vareciformis,** *Mast. in Trans. Linn. Soc.* xxvii. 639; leaves oblong-obovate acuminate entire, calyx-tube very short, ovary turbinate. Trichodia vareciformis, *Griff. Notul.* iv. 571.

MALACCA, *Griffith.*
Shrub, more or less rusty pubescent. *Leaves* 6 by 2¼ in., coriaceous, glabrous

above; petiole under ½ in. *Peduncles* ⅛ in. *Flowers* nearly ½ in. *Calyx*-segments leathery. *Petals* narrow at the base, ciliated. *Ovary* turbinate, villose. *Fruit* the size of a hazel nut, subglobose; rind dry, leathery. *Seeds* ovoid, flattened, pitted.—Larger in all its parts than *P. malayana.*

3. **MODECCA,** *Lam.*

Twining herbs or undershrubs. *Leaves* entire or palmilobed, usually with two or more flat, circular glands on the under surface and with similar glands at the apex of the petiole. *Cymes* axillary, few- or many-flowered, on long peduncles one or more of which is sterile and tendril-like. *Male flower*: *Calyx* tubular or bell-shaped; limb 5-lobed, lobes leathery, imbricate. *Petals* 5, free, membranous, 1-nerved, springing from the calyx-tube. *Corona* a ring of threads arising from near the base of the calyx-tube, or wanting. *Glands of the disc* 5, opposite the sepals, strap-shaped or capitate. *Andrœcium* cup-shaped, membranous beneath; filaments 5, linear-subulate; anthers linear-oblong, 2-celled. *Ovary* rudimentary or 0. *Female flower*: *Calyx* and *corolla* as in the male. *Corona* a membranous fold, springing from near the base of the calyx-tube or none. *Glands of the disc* 5, strap-shaped, capitate, opposite the sepals. *Staminodes* 5, forming a membranous cup surrounding the base of the ovary, above dividing into barren filaments. *Ovary* globose or elliptic, sessile or stalked; style cylindrical or none; stigmas 3, capitate or flat and dilated. *Fruit* capsular, 3-valved. *Seeds* numerous, attached by long funicles to parietal placentas.—Distrib. A small genus, native of the tropics of the Old World.

Sect I. **Microblepharis,** *W. & A.* *Petals* springing from the throat of the calyx-tube, stigmas sessile.

1. **M. Wightiana,** *Wall. Cat.* 6764; leaves membranous uniform or diverse all cordate ovate acute or some more or less palmately 3-lobed. *Wight Ic.* 179; *W. & A. Prodr.* i. 353; *Thwaites Enum.* 128. M. diversifolia, *Wall. Cat.* 6763.

Hills of the Western Peninsula, and Ceylon.

Root tuberous. *Branches* striated, roughish. *Leaves* 2–3 by 2 in., glabrous, from ovate entire rounded or slightly cordate at the base to hastate or palmately lobed; the central lobe longest, obtuse; nerves remote; petiole about 1 in., with a sessile gland on each side at the top. *Peduncles* axillary, filiform. *Flowers* not seen. *Calyx*, according to Wight's figure, small; tube short, lobes ovate. *Petals* broad, shorter than the sepals, attached to the throat of the calyx. *Ovary* subglobose, surmounted by three cuneate, fringed, reflexed stigmas. *Fruit* glabrous, the size of a small plum, subglobose or ovoid, 3-valved. *Seeds* flattened, heart-shaped, rugulose, with parallel ridges around the margins.—Wight and Arnott refer Wallich's *M. diversifolia* to *Vitis lanceolaria*, but the type specimen in Wallich's herbarium clearly belongs to the present species.

2. **M. singaporeana,** *Mast.*; leaves leathery shortly petioled oblong acuminate, flowers elongate, anthers apiculate. Passiflora singaporeana, *Wall. Cat.* 1232.

Malacca. Singapore, *Wallich.*—Distrib. Borneo.

Glabrous. *Leaves* 3–4 by 2 in., coriaceous, oblong-obovate, obtuse, tapering to the base, midrib prominent, secondary nerves remote; petiole ¼ in., with a large sessile gland on either side at the top. *Tendrils* as long as the petiole. *Male flowers* ¼ in., elongate-fusiform. *Calyx* leathery, shortly 5-lobed, lobes ovate, connivent (? always). *Petals* thick, leathery, oblong acute, springing from the calyx-tube just

beneath the throat. *Corona* none (?). *Glands of the disc* 5, small, oblong, at the base of the calyx-tube, opposite to its lobes. *Stamens* 5; anthers subsessile, erect, linear; connective long, thread-like. *Rudimentary ovary* fusiform. *Fruit* 2 in., long, glabrous, fusiform.—Maingay's specimens, like Wallich's, are very imperfect, but the two are sufficiently alike to leave no doubt of their specific identity.

1410 3. **M. cardiophylla,** *Mast.*; leaves membranous long petioled cordate-ovate acute shortly acuminate, anthers muticous.

SIKKIM, KHASIA MTS., and ASSAM.

Glabrous. *Branches* terete. *Leaves* remote, 6–8 by 4–5 in., entire, rarely palmately lobed, basal lobes rounded divaricate; petiole 2–3 in., with a sessile gland on either side at the apex. *Cymes* many-flowered, on a cylindrical peduncle as long as the petiole, one branch cirrose. *Male flowers* $\frac{1}{8}$ in., bell-shaped. *Calyx* leathery, spotted, 5-lobed to the middle; lobes oblong, obtuse. *Petals* membranous, white, ovate, obtuse, springing from about the middle of the tube. *Andrœcium* membranous and tubular below, above divided into five filaments; anthers linear-ovate, acute. *Glands of the disc* 5, small, opposite to the sepals. *Female flower*: *Calyx* $\frac{1}{2}$ in., funnel-shaped, slightly dilated above the base, leathery, spotted; lobes oblong, 3-nerved. *Petals* membranous, springing from the middle of the calyx-tube, oblong, 1-nerved, entire or minutely serrulate. *Glands of the disc* opposite the sepals, small, oblong, curved. *Barren stamens* forming a shallow membranous tube, divided above into filiform segments. *Ovary* raised on a short gynophore, ovoid, surmounted by a large peltate stigma with 3 reflexed wedge-shaped laciniate lobes.—In foliage very like the entire-leaved form of *M. palmata*, but the anthers and stigmas are quite different.

4. **M. cordifolia,** *Blume Bijdr.* 939; *Rumphia*, i. t. 49; leaves membranous cordate roundish acute not acuminate bullate, fruit elongate tapering to both ends. *Miq. Fl. Ind. Bat.* i. 702; *Kurz in Journ. As. Soc.* 1876, ii. 132 and 1877 ii. 95. ? M. heterophylla, *Kurz Andam. Rep. Append. A.* 39.

ANDAMAN ISLANDS, *Kurz*.—DISTRIB. Java.

Leaves 2–3 by 2 in., shortly petiolate, slightly glaucous beneath. *Calyx* elongate, constricted at the neck. *Petals* small. *Anthers* oblong muticous. *Fruit* 3 by 1 in. —I have seen no authentic specimen of this either from the Andamans or from Java. The specimen labelled by Kurz *heterophylla* in the herbarium has much larger and markedly acuminate leaves. It is probably an entire-leaved form of *M. palmata* or *M. trilobata*.

SECT. II. **Blepharanthes,** *W. & A.* *Petals* springing from the base of the calyx-tube. *Style* trifid or styles 3; stigmas capitate.

5. **M. trilobata,** *Roxb. Cor. Pl.* t. 297; *Fl. Ind.* iii. 133; leaves membranous cordate 3-lobed with a gland under each sinus, anthers muticous, fruit oblong. *Wall. Cat.* 1234; *Kurz in Journ. As. Soc.* 1877, ii. 95.

SIKKIM, ASSAM, KHASIA MTS., CACHAR, CHITTAGONG.

Glabrous. *Branches* terete, glabrous, sulcate. *Leaves* remote, broader than long, 6–8 by 8–9 in., 3–5-lobed, cordate or hastate at the base; lobes oblong-obovate, acuminate, central one narrowed to the base. *Glands* 2, orbicular, flat, on the under surface of the leaf near the base; petiole 4 in., cylindrical, with a pair of glands at the extreme apex. *Peduncles* axillary, 5–6 in., divided near the apex into a leafless, many-flowered cyme, one branch of which is cirrose. *Male flower*: *Calyx* less than $\frac{1}{4}$ in., campanulate, 5-lobed, lobes oblong, obtuse. *Petals* oblong-obovate, springing from the base of the calyx-tube. *Stamens* 5, united at the base, filaments slender; anthers linear, obtuse. *Glands of the disc* 5, ligulate, incurved, opposite the sepals. *Rudimentary ovary* minute. *Female flower*: *Calyx* and *petals* as in the male, but larger. *Glands of disc* 5, ribbon-like, recurved. *Staminodes* 5, united at the base

into a membranous cup. *Gynophore* short. *Ovary* elongate, ovoid; style short, stigma large capitate 3-lobed. *Fruit* scarlet, oblong, 2½ by 1½ in.

6. **M. palmata,** *Lam. Encycl.* iv. 209; leaves membranous glabrous glandular palmately lobed or entire, anthers obtuse muticous, fruit globose. *Wall. Cat.* 6762 A and B; *Wight Ic.* t. 201; *W. & A. Prodr.* 353; *Thwaites Enum.* 128; *Dalz. & Gibs. Bomb. Fl.* 104; *Miq. Fl. Ind. Bat.* i. 703. M. tuberosa, *Roxb. Fl. Ind.* iii. 134. M. integrifolia, *Lam. l. c.* (*not of Wall. Cat.* 6765).—*Rheede Hort. Mal.* viii. t. 20–23.

WESTERN PENINSULA and CEYLON.

Glabrous. *Branches* sulcate. *Leaves* remote, broader than long, 4–5 by 6–7 in., roundish, cordate, usually 3–5-lobed nearly to the base with a single circular flat gland beneath the sinus, sometimes entire, cordate, ovate, acuminate; lobes oblong-lanceolate, acuminate, tapering to the base; petiole 2 in., with a gland on either side at the apex. *Male flower*: *Calyx* about ½ in., campanulate, 5-lobed, dilated at the base, lobes ovate-acute. *Petals* linear-oblong, 3-nerved, ciliate, springing from the base of the calyx-tube. *Corona* a ring of threads from the tube of the calyx, just above the dilated portion. *Filaments* subulate, united at the base; anthers linear-oblong. *Female flower*: *Calyx* ¼ in., campanulate; lobes ovate acute. *Petals* linear, acute, ciliated, springing from the base of the tube. *Corona* a membranous fold fringed with white hairs, arising from near the base of the flower tube. *Glands of disc* oblong, opposite the sepals. *Staminodes* 5, forming a membranous cup surrounding the base of the ovary and above divided into flat strap-shaped filaments nearly as long as the glabrous subglobose ovary. *Style* nearly as long as the ovary, dividing into 3 branches; stigmas large capitate. *Fruit* the size of a small apple, subglobose. *Seeds* large, pitted, ribbed at the edges.—Root said to be poisonous, used as medicine by the Cingalese (Thwaites l. c.). *M. integrifolia*, Wall. Cat. 6765, is a garden specimen of uncertain identity not referable to the present species.

IMPERFECTLY KNOWN SPECIES.

M. ALIENA, *Wall. Cat.* 6766, from Silhet, is an Asclepiad, the flowers of which are too imperfect for determination.—There is no specimen in Wallich's herbarium.

M. APICULATA, *Mast.*; leaves membranous cordate roundish deeply 5-sect, segments lanceolate narrow at the base with a gland beneath the sinus on the under surface, anthers apiculate, fruit ovoid.—Burma, Pegu, *McClelland.*

Glabrous. *Branches* sulcate. *Petiole* 2 in. *Tendrils* very long. *Anthers* linear with a long slender apiculus. *Fruit* 1¼ in., ovoid, acute. *Seeds* subglobose slightly flattened.—Imperfect specimens only exist in the Kew herbaria, Sir Joseph Hooker who analysed the flower states in a note that it differs from *M. trilobata* by the apiculate anther. Possibly it may be the *M. furfuracea* of Wallich (see below).

M. FURFURACEA, *Wall. Cat.* 1235. Prome, *Wallich.*—There is no specimen of this in Wallich's herbarium.

M. NICOBARICA, *Kurz in Trimen Journ. Bot.* 1875, 327; *Journ. As. Soc.* 1876, ii. 132; leaves subcoriaceous oblong-acuminate rounded at the base and subpeltate. Passiflora penangiana, *Wall. Cat.* 1233.—Penang, *Wallich.* Malacca, *Griffith.*

Glabrous. *Stems* very slender, sulcate. *Leaves* 4 by 1–2 in., oblong or oblong-lanceolate, 1-nerved, secondary nerves remote, arched; petiole eglandular, ¾ in. attached to the blade just within the base. *Tendrils* about 2 in. branched, thickened at the ends. *Fruit* 1½–2 in. long, glabrous, oblong, acute, 3-valved. *Seeds* discoid.—The specimens of Wallich and of Maingay are imperfect, but evidently belong to the same species.

M. POPULIFOLIA, *Blume Rumphia*, i. t. 50.—To this I refer with doubt Maingay n. 668 with cordate ovate-acute leaves, petioles with two large apical glands, fruits about 3 in. long tapering to both ends.

ORDER LXV. **CUCURBITACEÆ.** (By C. B. Clarke, F.L.S.)

Climbing herbs or shrubs; tendrils solitary, lateral, spiral, simple or divided. *Leaves* alternate, petioled, frequently cordate, simple lobed or pedately divided. *Flowers* monœcious or diœcious, yellow or white, racemed and solitary, less commonly panicled. *Calyx-tube* wholly adnate to the ovary (except in *Actinostemma*); limb rotate campanulate or tubular; lobes 5 (rarely 3), imbricate. *Petals* 5, inserted on the calyx-limb, united in a tube or nearly or quite free, sometimes fimbriated at the margin, valvate or involute in the bud. *Stamens* inserted at the mouth or about the middle or at the base of the calyx-tube, usually 3 (sometimes 5 or 2); anthers free or united into a tube, one usually 1-celled and the other two 2-celled, cells straight or flexuose or conduplicate, the connective sometimes crested or produced. *Ovary* inferior (in *Actinostemma* half-superior), usually 3-carpellary; style 1 with 3 stigmas, more rarely styles 2–3–4; placentas usually 3, vertical, in double lines, the edges of the carpellary leaves being often turned in so far that the ovary (in flower time even) is spuriously 3-celled; ovules usually many, horizontal, rarely pendulous, sometimes few and pendulous from near the top of the ovary (in *Dicælospermum* 3 erect from the base of the ovary ?). *Fruit* generally berried or fleshy, indehiscent or dehiscing by valves or by a stopple, often 1-celled, the seeds being often packed in pulp or fibre. *Seeds* usually many, often compressed, horizontal, pendulous (or in *Dicælospermum* erect), frequently corrugated or subspinose on the margins, albumen 0.—DISTRIB. Species 400, in the warmer parts of the whole globe especially in the tropics.

TRIBE I. **Cucumerineæ.** *Ovules* horizontal (or pendulous). Female *flowers* usually solitary, never panicled. *Leaves* not divided into distinct leaflets (except rarely in *Thladiantha*).

A. *Anther-cells conduplicate or sigmoid.*

* *Corolla divided nearly or quite to the base into 5 petals.*

† *Petals fimbriate at their margin.*

Seeds 6. Calyx-tube 3–4 in. . . . . 1. HODGSONIA.
Seeds many. Calyx-tube less than 3 in. . . . . . 2. TRICHOSANTHES.

†† *Petals entire.*

a. calyx-tube of the male flower elongate; anthers usually included in the tube or nearly so.

Seeds many, horizontal. Tendrils rarely divided . 3. GYMNOPETALUM.
Seeds many, horizontal. Tendrils 2–3-fid. Petiole without glands. . . . . 4. WAREA.
Seeds 12–18, pendulous . . . . 5. HERPETOSPERMUM.
Tendrils divided. Fruit very large. Petiole with 2 glands at apex . . . . 6. LAGENARIA.

b. Calyx-tube of the male flower short; anthers usually exserted from the tube or nearly so.

a. Stamens inserted near the mouth of the calyx-tube; anthers hardly or not at all cohering.

Male flowers (partly) in racemes. Fruit opening by a stopple . . . . 7. LUFFA.
Flowers all solitary. Fruit very fleshy, indehiscent . 8. BENINCASA.

β. Stamens inserted below the mouth of the calyx-tube; anthers more or less cohering.

Male flowers (partly) racemed. Tendrils simple . . 9. MOMORDICA.
Male flowers clustered or solitary. Tendrils simple . 10. CUCUMIS.
Flowers all solitary. Tendrils 2–3-fid . . . . . . 11. CITRULLUS.

** *Corolla campanulate, divided half way down or thereabout.*

Tendrils simple. Flowers white . . . . 12. CEPHALANDRA.
Tendrils divided. Flowers yellow . . . . 13. CUCURBITA.

B. *Anther-cells straight (or in* Bryonia *somewhat curved).*

* *Flowers not large, yellow, male racemes or pedicels not stout.*

† *Male and female pedicels 1-flowered, clustered.*

Tendrils 2-fid . . . . 14. BRYONIA.
Tendrils simple . . . . 15. MUKIA.

†† *Male flowers corymbose or subumbellate or racemed.*

Fruit shortly peduncled. Connective not produced . 16. ZEHNERIA.
Fruit on a capillary peduncle. Connective produced . 17. MELOTHRIA.
Fruit sessile, beaked . . . . 18. RHYNCHOCARPA.
Fruit circumsciss near the base . . . . 19. CORALLOCARPUS.
Fruit subsessile, indehiscent, without a beak . . . 20. CERASIOCARPUM.
Ciliate bracts resembling stipules at base of the petioles . . . . 21. CTENOLEPIS.

** *Flowers large deep yellow, male raceme stout.*

Calyx-tube short. Seeds very many . . . . . . 23. THLADIANTHA.
Calyx-tube elongate. Seeds 3–9 . . . . 24. EDGARIA.

TRIBE II. **Orthospermeæ.** *Ovules* and seeds erect.

Seeds 3, each with two empty cells . . . . 22. DICÆLOSPERMUM.

TRIBE III. **Zanonieæ.** *Ovules* pendulous. *Flowers* small, the females in panicles or many-flowered racemes. *Stamens* 5, free, each with a single small straight anther.

A. *Leaves not divided into separate leaflets.*

Fruit small circumsciss. Leaves serrate . . . . . 26. ACTINOSTEMMA.
Fruit long clavate. Leaves subentire . . . . . . 28. ZANONIA.

B. Leaves pedately divided into 3–5 leaflets.

Fruit trigonous obovoid. Leaflets serrate. Tendrils bifid . . . . 25. GOMPHOGYNE.
Fruit pea-like. Leaflets serrate. Tendrils simple . 27. GYNOSTEMMA.
Fruit elongate clavate. Leaflets entire . . . . . 29. ALSOMITRA.

1. **HODGSONIA,** *H. f. & T.*

A large climber. *Leaves* coriaceous, 3–5-lobed, long-petioled; tendrils 2–3-fid. *Flowers* large, diœcious; males in long racemes; bracts oblong, entire, deciduous; females solitary. MALE: calyx long-tubular, mouth shortly campanulate, teeth 5, short; petals 5, connate at the base, very long-fimbriate; stamens 3, filaments very short; anthers exserted, connate, linear, one 1-celled, two 2-celled, cells conduplicate. FEMALE: calyx and corolla as in the male; ovary globose, 1-celled; style long, stigmas 3 oblong bifid exserted; placentas 3, parietal, near the base of the ovary, 2-ovulate on each side. *Fruit* large, depressed globular, 12-grooved, flesh hard; perfect seeds usually six, each having a smaller commonly barren one attached to its side, flat-ellipsoid, with sunk veins.

1. **H. heteroclita,** *H. f. & T. in Proc. Linn. Soc.* ii. 257; *Hk. f. Ill. Himal. Pl.* t. 1, 2, 3; *Fl. d. Serres,* t. 1262; *Kurz in Journ. As. Soc.* 1877, pt. ii. 97. Trichosanthes heteroclita, *Roxb. Fl. Ind.* iii. 705; *Wall. Cat.* 6684, A, B, C. T. grandiflora, *Wall. Cat.* 6685 *not of Blume.*

SIKKIM; alt. 0–4000 ft. ASSAM. KHASIA MTS. alt. 0–3000 ft. EAST BENGAL and CHITTAGONG; PEGU and MARTABAN; *Kurz.* PINANG and MALACCA.

Stem extending sometimes 100 ft. *Leaves* 6–8 in. long and broad, glabrous, deeply lobed; lobes entire or very sparingly denticulate, acute. Male *racemes* 8 in.; bracts $\frac{1}{4}$ in. *Calyx* often rusty-pubescent without, tube 3–4 by $\frac{3}{8}$ in. *Corolla-lobes* 2 in., brown-villous, 3-nerved without, white, tinged yellow within, ending in a fringe 4 in. *Fruit* 4–10 in. wide, red-brown, closely tomentose. *Seeds* 2–3 by 1–1$\frac{1}{2}$ in.

2. **TRICHOSANTHES,** *Linn.*

Scandent herbs. *Leaves* entire or 3–9-lobed, denticulate; tendrils usually 2–5-fid. *Flowers* diœcious less often monœcious, white; male peduncles usually in axillary pairs, one 1-flowered caducous, the other racemose; bracts large or small or 0; female flower solitary. MALE: calyx long-tubular; teeth 5, lanceolate, entire serrate or laciniate. *Corolla* 5-fid nearly to the base, lobes long-fimbriate; stamens 3; anthers almost included, connate (free in *T. dioica*), long-linear, one 1-celled, two 2-celled, cells conduplicate. FEMALE: calyx and corolla as in the male. *Ovary* inferior, at the base of the calyx-tube, 1-celled; style filiform, 3 or 6-fid at apex; placentas 3, parietal; ovules very many, horizontal, half-pendulous. *Fruit* lanceolate or globose, smooth, acute or obtuse at the apex. *Seeds* many, horizontal, packed in pulp, compressed, ellipsoid, sometimes angular on the margin.—DISTRIB. Species 20, in South-East Asia, extending through Malaya to North Australia in one direction, through China to Japan in another.

* *Bracts of the male raceme large, sheathing the flowers from a broad base.*

1. **T. palmata,** *Roxb. Fl. Ind.* iii. 704; leaves palmate half-way down in 5 or 3–7 broad lobes (but vary from angular nearly entire to deeply palmate with linear-oblong lobes), bracts ovate or obovate lacerate or strongly serrate, fruit globose the size of a small orange, seeds $\frac{3}{8}$ in. scarcely angular on the margins. *Wall. Cat.* 6688 *excl.* C, F; *W. & A. Prodr.* 350 *as to a and β*; *Wight Ill.* t. 104, 105; *Dalz. & Gibs. Bomb. Fl.* 103. T. laciniosa, *Wall. Cat.* 6689 A, B. T. aspera, *Heyne in Herb. Rottler.* T. tricuspis, *Miq. Fl. Ind.*

Bat. i. pt. i. 679. T. cordata, *Wall. Cat.* 6686 *excl.* A *and* B. T. anguina, *Wall. Cat.* 6687 F *partly.* T. bracteata, *Kurz in Journ. As. Soc.* 1877, pt. ii. 99. Cucurbita Melopepo, *Wall. Cat.* 6725. Involucraria Wallichii, *Seringe in DC. Prodr.* iii. 318. Bryonia palmata, *Wall. Cat.* 6711 F.

From the HIMALAYAS to CEYLON and SINGAPORE; very common in all moist thickets, ascending to 5000 ft.—DISTRIB. Malaya, China, Japan, North Australia.

Climbing often 30 ft. *Diœcious* so far as all the examples go, but Roxburgh has placed it in Monœcia without remark. *Leaves* 2–6 in. diam., not at all hairy beneath, usually glabrous or less commonly scabrous on the nerves, often with several large glands near the apex of the petiole, cordate at the base; segments dentate, serrate, divaricate, sometimes subpinnatifid (var. *incisa* Heyne), usually acute (but obtuse in var. *sinuata*, Heyne); petiole 1–3 in. *Tendrils* commonly 3-fid. Male *peduncles* usually paired, the racemed one 6 in., naked below; bracts ovate or obovate, glabrous or viscid with scattered glands or pubescent. *Calyx-tube* 1½ in., closely tomentose or glabrous; sometimes much larger in the Sikkim examples; teeth long-lanceolate, sometimes dentate serrate or subpinnatifid. *Fruit* 1¼–2 in. diam., not acute, bright red with 10 orange streaks. *Seeds* very many, immersed in green pulp.—The extreme forms of the leaves are *var. laciniosa*, Wight, which has the leaves palmate nearly to the base, the segments scarcely ¼ in. wide and sometimes subpinnatifid; and *var. Thomsoni* from Moradabad with the leaves entire and slightly 5-angular: in both the leaves are coriaceous and with their petioles more or less covered with scattered round white minute flat scales. The Himalayan specimens recede further by their large subsucculent flaccid leaves and very large flowers.

VAR. *Scotanthus*, C. B. Clarke; calyx-teeth broad-lanceolate entire, petals nearly destitute of fimbriations especially in the female.

VAR. *tomentosa*, Heyne in Herb. Rottler; leaves tomentose beneath divided not more than half-way down.—Deccan Peninsula Mts.; *Wight* No. 1134, 1136 partly; *G. Thomson*. Ceylon, alt. 2600 ft.; *Gardner*.—This looks like a good species but the fruit and seeds are as in var. 1. This closely resembles the Australian *T. subvelutina Muell. in Herb.* referred to *T. palmata* by Bentham. The distribution of *T. palmata* is extended to Japan on the faith of two examples collected by Maximowicz. They belong to the commonest Bengal type of *T. palmata*, but bear the name *T. japonica*, Regel, which in *Regel Ind. Sem.* 1868, p. 90, is said to have solitary male flowers, and has been referred by authors to the neighbourhood of *T. cucumerina*. A *Trichosanthes* collected in Mergui by Griffith No. 759 (No. 2532 Kew Distrib.) has the leaves with short hairs beneath; otherwise resembles the var. *tomentosa*.

2. **T. multiloba,** *Miq. Ann. Mus. Lugd. Bat.* ii. 82; leaves deeply (only half-way down) palmate in 5 or 3–9 lobes narrowed near their base, bracts ovate or obovate deeply serrate, fruit 2–4 in. ovoid or oblong acute, seeds ⅜–¾ in. more or less angular on the margins. T. grandibracteata, *Kurz in Journ. As. Soc.* 1877, pt. ii. 99 *ex descr.*

SIKKIM, East Himalaya and KHASIA MTS.; alt. 2000–6000 ft.; plentiful. MALACCA? *Maingay* 671.—DISTRIB. China?. Bhamo. Japan.

Rambling extensively. *Diœcious. Leaves* 3–6 in. diam., usually glabrous beneath or less commonly scabrous with scattered bristles, subcordate at the base; segments serrate (sometimes lobed), ascending, less divaricate than in *T. palmata*, acute; petiole 1–3 in., often with several large glands near the apex; tendrils commonly 3-fid. Male *peduncles* usually paired, the racemed one 6 in., naked below. *Calyx-tube* 1–2½ in.; teeth lanceolate-subulate, entire. *Fruit* bright red with orange streaks. *Seeds* very many in green pulp.—This is perhaps a variety of *T. palmata*, the Himalayan large form of which it so closely resembles, that in the absence of the fruit it cannot always be distinguished from it.—The locality "China" is added on the faith of Hance's No. 13,745 marked *T. palmata Roxb.* which it may be, as it does not exhibit fruit nor does Maingay's Malacca example.

VAR. ? *majuscula* (*Trichosanthes sp.* 7 *Herb. Ind. Or. Hk. f. & T.*); male raceme stout more than 1 ft., bracts long little serrate, leaves very large. Khasia Mts.; alt. 4000 ft.; *Hk. f. & T.*—Perhaps a new species, but the examples consist of male racemes and leaves only. No. 12,298 C. B. Clarke (Darjeeling alt. 3000 ft.) seems the same.

3. **T. cordata,** *Roxb. Fl Ind.* iii. 703; leaves cordate-ovate acute entire or obscurely angular-lobed hairy beneath, bracts elongate obovate entire or scarcely serrate, fruit globose size of a small orange, seeds ½ in. scarcely angular on the margins. *Wall. Cat.* 6686 A.; *Kurz in Journ. As. Soc.* 1877, pt. ii. 99. T. tuberosa, *Roxb. Ic. ined.* T. palmata, *Wall. Cat.* 6688 F *partly*, & C.

From the base of the EASTERN HIMALAYA in SIKKIM and ASSAM to PEGU. Frequent in the KHASIA Terai and CACHAR.

An extensive climber. *Diœcious. Leaves* often 6–8 in., dentate-serrate; tendrils usually 3-fid. Male *peduncles* usually paired, the racemed one often 8 in., stout; bracts pubescent. *Calyx-tube* 1½ in., densely hairy without, segments finely acuminate. *Fruit* almost exactly as in *T. palmata*, bright red, orange-streaked, apex not acute.

VAR. *subpedata*; leaves pedately lobed almost to the base.—Cachar; *C. B. Clarke.*—The bracts and indumentum are exactly as in the type. Judging by the description, *T. macrosiphon, Kurz in Journ. As. Soc.* 1872, pt. ii. 308, differs less from *T. cordata, Roxb.* than does this var. *subpedata.*

** *Bracts of the male raceme large, subpersistent, narrowed to the base, not sheathing.*

4. **T. truncata,** *C. B. Clarke*; leaves ovate from a truncate hastate or obtuse (not cordate) base sometimes subpeltate entire or irregularly tricuspid glabrous denticulate or not, bracts ovate slightly serrate nearly glabrous, female plant unknown.

SIKKIM, alt. 1000 ft.; *J. D. H.* KHASIA MTS., alt. 4000 ft. (Cherra Coal-pit) *H. f. & T.*; *C. B. Clarke.*

Stem twining; tendrils 2–3-fid. *Leaves* glabrous coriaceous or membranous, polymorphous, sometimes exactly ovate with a rounded subentire margin sometimes deeply 3-cuspidate. Male *peduncle* 6 in. *Calyx-tube* ¾–1½ in., somewhat tomentose without: corolla (ex Hook. f.) greenish-white.

5. **T. himalensis,** *C. B. Clarke*; leaves palmately 3-lobed deeply cordate villous or pubescent beneath, bracts lanceolate incise-serrate, fruit 3–4 in. long-cylindric tapering at both ends. T. cordata, *Wall. Cat.* 6686 B. Cucurbita ficifolia, *Wall. Cat.* 6721.

SIKKIM, alt. 2000–5000 ft. from Yoksun to the plains; *J. D. H., C. B. Clarke.*

Stems extensively climbing, with the petioles and leaves pubescent and hairy. *Diœcious. Leaves* 5 in., usually deeply palmate, irregularly serrate; tendrils 3-fid. Male *peduncles* 3–4 in., bracts ½–¾ in. *Calyx-tube* 1½–2 in., very narrow, little hairy without. *Fruit* 3–4 by 1–1¼ in., nearly circular in section. *Seeds* ¼–⅓ in. diam., polymorphous, sometimes obovoid the broader part subtrimerous, sometimes drum-shaped.—Certain seeds were sent by Dr. Anderson to Naudin, who grew them and has placed the resulting leaves in the Kew Herbarium accompanied by a drawing of the seed, and has attached the name *Platygonia himalensis* thereto. These leaves may belong to the present species.

VAR. *glabrior*; leaves glabrous above pubescent or scabrous on the nerves beneath.—Khasia; alt. 4000 ft. Trichosanthes sp. 9 *Herb. Ind. Or., H. f. & T.*—The examples are of leaves and male racemes only.

*** *Bracts of the male raceme* 0 *or minute.*

6. **T. dicælosperma,** *C. B. Clarke*; leaves cordate-ovate acute denticulate softly shortly pubescent on both surfaces, fruit 1½ in. diam. globose, seeds ⅓ in. compressed subquadrate equally 3-celled the lateral cells empty. ? T. reniformis, *Kurz in Flora* 1871, 294.

SIKKIM, alt. 2000–5000 ft.; *J. D. H.* KHASIA MTS., alt. 4000 ft.; *H. f. & T.*

Stems long, twining, innovations at least pubescent. *Diæcious. Leaves* 4 by 3½ in., not at all lobed; petiole 1½ in.; tendrils 2-fid. Male *peduncles* paired, one early 1-flowered, the other 2–3 in., racemed, ebracteate. *Calyx-tube* 1¼ in., narrow, pubescent. *Fruit* pubescent, with 10 paler vertical bands. *Seeds* in orange pulp.—This is perhaps Kurz's *reniformis* obtained in Sikkim, but it can hardly be *T. reniformis, Miq. Fl. Ind. Bat.* i. pt. i. 675, which has obtuse lobes to the leaves and the male spikes leafy-bracteate.

7. **T. dioica,** *Roxb. Fl. Ind.* iii. 701; leaves cordate oblong acute, petiole scabrous woolly, male flowers not racemed woolly without, anthers free. *Wall. Cat.* 6692 A, B, D.

Throughout the plain of NORTH INDIA from the PUNJAB to ASSAM and EAST BENGAL; common.

Stems twining extensively, more or less woolly and scabrous. *Diæcious. Leaves* 3 by 2 in., harsh, sinuate-dentate, not lobed; petiole ¾ in.; tendrils 2-fid. Male *peduncles* paired, the second-flowering often 2 in. but not racemed in any example at Kew. *Calyx-tube* 1¾ in., narrow. *Fruit* 2–3½ in., oblong or nearly spherical, acute, orange-red. *Seeds* ⅜–½ in., half-ellipsoid, compressed, corrugate on the margin.—United with the next species by *Benth. in Fl. Austral.* iii. 315. Roxburgh says "Stamens three distinct" which has been repeatedly verified in the living plant.

8. **T. nervifolia,** *Linn.*; *DC. Prodr.* iii. 314; leaves cordate oblong acute, petiole glabrous, male flowers partly racemed glabrous. *W. & A. Prodr.* 349. T. cuspidata, *Lamk.*; *DC. Prodr.* iii. 314.—*Rheede Hort. Mal.* t. 16, 17.

DECCAN PENINSULA; Quilon, *Wight.* Kurg (tropical region); *G. Thomson.* CEYLON; not uncommon up to 5000 ft.; *Thwaites.*

Stems twining, glabrous. *Diæcious. Leaves* 3 by 1½–2 in., membranous, sinuate-dentate, not lobed; petiole ¾ in.; tendrils 2-fid. Male *peduncles* usually paired, the second-flowering carrying a raceme (finally elongate and zigzag) of about 12 flowers. *Calyx-tube* 1½ in. *Fruit* (and seeds from Rheede's drawing) 2–3 in., circular in section, about twice as long as broad, acute. *Seeds* ⅜–½ in., half-ellipsoid, compressed, corrugated on the margin.

9. **T. cucumerina,** *Linn.*; *DC. Prodr.* iii. 315; leaves cordate subreniform 5- (3–7-) lobed or 5-angular lobes not acuminate pubescent or puberulous on both surfaces, fruit 1–3 in. ovoid-conical, seeds corrugate. *Roxb. Fl. Ind.* iii. 702; *Wall. Cat.* 6690 A, B, C, D, F; *Blume Bijd.* 933; *Dalz. & Gibs. Bomb. Fl.* 102; *Miq. Fl. Ind. Bat.* i. pt. i. 676; *Naud. in Ann. Sc. Nat. ser.* 4, xviii. 191; *Kurz in Journ. As. Soc.* 1877, pt. ii. 98. T. laciniosa, *Klein in Herb. Rottler.* T. pilosa, *Wall. Cat.* 6691. Bryonia umbellata, *Wall. Cat.* 6700 D. Cucumis Missionis, *Wall. Cat.* 6728.

Throughout INDIA and CEYLON.—DISTRIB. Malaya, North Australia.

Stems twining, more or less pubescent. *Diæcious* or less often (? when cultivated) *monæcious. Leaves* 2–4 in. diam., usually 5-lobed about half-way down, lobes obtuse or if acute not acuminate; petiole ¾ in.; tendrils 2-fid. Male *peduncles* in pairs, the earlier 1-flowered, the later racemed; occasionally in place of the earlier is found a female. *Calyx-tube* 1 in. *Seeds* ⅜–½ in., half-ellipsoid, compressed, in red pulp.—In *Bth. & Hk. f. Gen. Pl.* i. 833, under *Ceratosanthes, T. cucumerina* is a misprint for *T. corniculata.*

10. **T. anguina,** *Linn.*; *DC. Prodr.* iii. 314; leaves cordate subreniform 5- (3–7-) lobed or 5-angular lobes not acuminate pubescent or puberulous on both surfaces, fruit elongate cylindric sometimes contorted, seeds corrugate. *Roxb. Fl. Ind.* iii. 701; *Bot. Mag.* t. 722; *Blume Bijd.* 933; *W. & A. Prodr.* 350; *Wall. Cat.* 6687; *Lamk. Ill.* t. 794; *Miq. Fl. Ind. Bat.* i. pt. i. 677 ?; *Naud. in Ann. Sc. Nat.* ser. 4, xviii. 91; *Kurz in Journ. As. Soc.* 1877, pt. ii. 98.

INDIA, cultivated.—DISTRIB. China, Malaya.

Except in the fruit this agrees altogether with *T. cucumerina*, of which it is probably a cultivated form. The fruit, used as a vegetable, is eminently polymorphous. Miquel places this species at the head of his *Involucrariæ* which he states to have great leafy sheathing bracts to the male flowers, but in the Indian *T. anguina* these bracts are minute.

11. **T. lobata,** *Roxb. Fl. Ind.* iii. 701; leaves cordate orbicular 5-lobed half-way down or more lobes acuminate pubescent, fruit oblong acute, seeds smooth. *Wall. Cat.* 6693.

DECCAN PENINSULA; *Wight*; *Rottler, G. Thomson*, &c.

Stem and petioles with flaccid hairs. *Leaves* pubescent beneath, and with flaccid hairs; tendrils 3–5-fid. *Fruit* 2–4 by 1–2 in., acute at both ends. *Seeds* half-ellipsoid, compressed, margins entire.—Probably a variety of *T. cucumerina* as suggested by *W. & A. Prodr.* 350. *T. lobata*, Kurz in Journ. As. Soc. 1877, pt. ii. 98, having the seeds tubercled (from Chittagong) is perhaps nearer *T. cucumerina* or *T. anguina* as here understood: but the three species are difficult to separate.

12. **T. integrifolia,** *Thwaites Enum.* 127, *not of Kurz*; diœcious, leaves glabrous nerved elliptic or ovate acuminate less often lanceolate 3-nerved entire coriaceous base rounded or cordate, tendrils simple, flowers somewhat large solitary, fruit spherical shortly apiculate, seeds numerous crowded.

CEYLON, alt. 2000–4000 ft.; *Thwaites.*

Leaves 2½–6 by 1¼–2 in.; petiole ⅜ in. *Fruit* 2 in. diam., red. *Seeds* ½ in., smooth, oblong, oblique, compressed, truncate at the hilum, with two indentations at the vertex, testa blackish green.—Not seen. The above description is translated from Mr. Thwaites, who has been careful in communicating examples to Kew of all his types; but his No. 1629 is not to be found in its place. Mr. Thwaites describes no bracts to the male inflorescence, and if the male flowers are all solitary the species must be near *T. dioica*, Roxb.

DOUBTFUL SPECIES.

T. MACROSIPHON, *Kurz in Journ. As. Soc.* 1172, pt. ii. 308, from Tenasserim, in the absence of both the male inflorescence and the fruit cannot be identified from the description. It might be *T. cordata*, Roxb.

TRICHOSANTHES SP. *Griffith* (No. 2543 Kew Distrib.); nearly glabrous, tendrils 2-fid, leaves 3-foliolate very coriaceous, leaflets lanceolate nearly entire the central one somewhat obovate the lateral ones unequally auricled on the outer base, petiole nearly 2 in., petiolules ⅕ in., fruit oblong-ovate but nearly spherical red with yellowish streaks, seeds very many in green pulp brown compressed, margin somewhat angular at the hilum end.—Malacca, *Griffith.*—This imperfect description is drawn up from a fragment with leaves and from Griffith's note of the fruit attached thereto. The characters appear nearly those of *Telfairia*, but the habit and texture are those of *Hodgsonia*; while from Griffith's description of the fruit it appears he did best by placing it provisionally in *Trichosanthes.*

3. GYMNOPETALUM, *Arn.*

Twining herbs, tendrils usually simple or 2-fid. *Leaves* petioled, 5-angular, nearly entire or deeply lobed. *Flowers* white (or yellow ?), somewhat large; monœcious at least sometimes: male peduncles in fully developed plants 2 from each axil, the earlier 1-flowered, the later longer racemose, either often suppressed; bracts in the racemes persistent, large lanceolate incised or small; females 1-flowered usually in separate axils. MALE: calyx-tube long, contracted near the mouth, limb of 5 lanceolate segments; petals 5, not fimbriate on margin; stamens 3; anthers included, connate, elongate, 1-celled, 2-celled, cells conduplicate; rudiments of the ovary 1 or 3, small, linear. FEMALE: calyx and corolla as in the male; ovary oblong; style long, stigmas 3 short linear; ovules horizontal, many; placentas 3, long, vertical. *Fruit* ovate-oblong, acute at both ends. *Seeds* many or few, ellipsoid, compressed, margined, nearly smooth.—DISTRIB. Species 5; in India, China and Malaya.

1. **G. cochinchinense,** *Kurz in Flora* 1871, 295; leaves 5-angled or lobed about half-way down, bracts to the male racemes prominent narrowed at the base deeply lacerate at the apex. Bryonia cochin-chinensis, *Lour. Fl. Cochinch.* 595; *DC. Prodr.* iii. 305. Momordica tubiflora, *Roxb. Fl. Ind.* iii. 711, *not of Wallich.* Tripodanthera cochinchinensis, *Roem. Synops.* ii. 48. Scotanthus tubiflorus, *Naud. in Ann. Sc. Nat.* ser. 4, xvi. 172, t. 3. Trichosanthes cucumerina, *Wall. Cat.* 6690 E. T.? Fatoa, *Ham. in Wall. Cat.* 6695. Bryonia grandis, *Wall. Cat.* 6700 K, L.

SIKKIM, up to 2000 ft. alt. ASSAM, CACHAR and BENGAL, common. CHOTA NAGPORE. TENASSERIM; *Helfer.*—DISTRIB. Malaya, China.

Stems slender, 5-angular, more or less scabrous-hairy. *Leaves* 2–3 in. diam., scabrous on both surfaces; tendrils simple or 2-fid. Male racemed *peduncle* sometimes 6–8 in., usually shorter; bracts $\frac{3}{4}$ in., incise-serrate, lobes often again incised. *Calyx-tube* $\frac{3}{4}$ in., villous, closed by deflexed hairs within above the stamens. Rudiments of the *ovary* in the male flower 3. *Petals* $\frac{1}{2}$ in., ovate, entire or somewhat crenate. *Fruit* 2 by $\frac{3}{4}$ in., orange-red, somewhat scabrous, with 10 longitudinal ribs, pulp greenish, not very succulent. *Seeds* $\frac{1}{4}$ by $\frac{1}{12}$ and $\frac{1}{20}$ in. thick.

2. **G. quinquelobum,** *Miq. Fl. Ind. Bat.* i. pt. i. 681; leaves suborbicular deeply 5-lobed lobes often subpinnatifid, bracts of the male racemes oblong serrate. Scotanthus Porteanus, *Naud. in Ann. Sc. Nat.* ser. 5, v. 25. ?G. heterophyllum, *Kurz in Trimen Journ. Bot.* 1875, p. 326.

RANGOON; *McClelland.* PINANG; *Porter.* MALAY PENINSULA; *Griffith.* SINGAPORE; *G. Thomson.*—DISTRIB. Malaya to Borneo.

Agrees very closely with the last species: the segments of the leaves are here narrow, subsinuate, 3-fid or pinnatifid, but graduate towards the half-lobed form of *G. cochinchinensis.*—Kurz's *G. heterophyllum* agrees as described with the present species; it is perhaps a specimen with poorly developed male racemes. Kurz says the flower is white, and quotes *Bryonia heterophylla, Wall. Cat.* 6711, which obscures the whole matter, for that plant is *Bryonia palmata,* Wall. (now *Cephalandra*) while *B. heterophylla,* Wall. No. 6704 (and of which there is a solitary sheet) differs altogether from Mr. Kurz' description and is a *Cerasiocarpum.*

3. **G. Wightii,** *Arn. in Hook. Journ. Bot.* iii. 278; leaves 5-angled or -lobed, bracts of the male racemes small simple linear. *Thwaites Enum.* 127. G. zeylanicum, *Arn. l. c.* Bryonia tubiflora, *W. & A. Prodr.* 347. Cucurbita umbellata, *Wall. Cat.* 6724.

SOUTH DECCAN PENINSULA; *Wight*; CANARA, *Hohenacker* No. 662. CEYLON, ascending to 5000 ft., *Walker, Gardner, Thwaites.*

Leaves 2 in. diam., more or less pubescent on both surfaces, denticulate, lobes acute or obtuse or 0; petiole 1 in. Male racemed *peduncle* 2 in.; flowers crowded, subumbellate; bracts $\frac{1}{4}$ in., linear, pedicels often $\frac{1}{4}$ in.; peduncle of the female flowers $\frac{3}{8}$ in. *Calyx-tube* $\frac{1}{2}$ in., slender, with scattered hairs or very pilose, lobes small. *Petals* $\frac{1}{4}$ in. (yellow according to Arnott and Hook. f., white according to Thwaites). Rudiment of the *ovary* in the male flower simple. *Fruit* $1\frac{1}{2}$–2 in., red, more or less hairy, not ribbed. *Seeds* $\frac{1}{4}$ by $\frac{1}{12}$ in., without corrugations or angles.—*Bryonia tubiflora, Wight* No. 1118 has the calyx-tube pubescent and is nowise distinguishable from the Ceylon plant as Mr. Thwaites surmised in *Enum.* p. 127.

4. **G. integrifolium,** *Kurz in Flora* 1871, 295; leaves cordate-ovate nearly entire, male peduncles 1-flowered solitary without bracts. Cucumis integrifolius, *Roxb. Fl. Ind.* iii. 724; *Wall. Cat.* 6730. Trichosanthes officinalis, *Wall. Cat.* 6694. T. integrifolia, *Kurz in Journ. As. Soc.* 1877, pt. ii. 99.

BENGAL; *Roxburgh.* Ponlong (IRRAWADDY estuary); *Wallich.*

Stem scabrid; tendrils undivided in Wallich's specimen (2-fid in Roxburgh's drawing. *Leaves* 3 in. diam., very harshly scabrous above, densely villous beneath, margin undulate scarcely denticulate; petiole 1 in. *Flowers* monœcious, all solitary, white; male peduncle $1\frac{1}{4}$ in., female peduncle $\frac{1}{4}$ in. MALE: calyx-tube elongate, densely brown-villous, teeth 5, lanceolate; corolla divided nearly to the base, lobes obovate, entire, yellow-veined, pubescent. FEMALE: calyx and corolla as in the male; stigmas 3, oblong. *Fruit* from Roxburgh's figure $\frac{5}{8}$–$\frac{3}{4}$ in. diam., orange-red, globular, smooth.—*Wall. Cat.* 6694 consists of three leaves with one male peduncle and calyx, and a detached fruit; the leaves resemble those of *Trichosanthes dioica*, Roxb.

4. WAREA, *C. B. Clarke.*

Extensively scandent, tendrils 2–3-fid. *Leaves* long-petioled, ovate or deeply 5-lobed. *Flowers* large, yellow, diœcious; males frequently two peduncles from one axil, one early deciduous 1-flowered, the other bearing a raceme without bracts; females solitary on long peduncles. MALE: calyx-tube cylindric, narrow, then suddenly widened campanulate subhemispheric, teeth 5, linear; petals 5, ovate, nearly separate, entire; stamens 3; anthers connate, included, one 1-celled, two 2-celled, cells conduplicate. FEMALE: calyx and corolla as in the male; ovary oblong; style long, with 3 wide stigmatic lobes; ovules horizontal, many, placentas 3, vertical. *Fruit* oblong, attenuate at both ends, 3-angular, 6-ribbed, 3-valved nearly to the base. *Seeds* in each cell about 16, in two rows, horizontal, compressed, ellipsoid, smooth.

Differs from *Gymnopetalum* by the large campanulate mouth to the calyx, by the divided tendrils, and the anthers exserted from the tubular portion of the calyx. Named after *J. Ware Edgar, C.S.I.*

1. **W. tonglensis,** *C. B. Clarke in Journ. Linn. Soc.* xv. 129. Gymnopetalum sp. No. 6, *Herb. Ind. Or., H. f. & T.*

SIKKIM, alt. 6000–10,000 ft., very common; *H. f. J. D. H.*; Tonglo N., *C. B. Clarke.*

Stem and peduncles nearly glabrous. *Leaves* 6–9 by 4–5 in., polymorphous, cordate, denticulate, nearly glabrous, ovate acute or 5-lobed or cut nearly to the base into narrow segments; petiole 4 in. Male *peduncle* 8 in., pedicels $\frac{1}{2}$–$\frac{3}{4}$ in. *Calyx-tube* $1\frac{1}{4}$ in., pubescent, cylindric portion more than $\frac{3}{4}$ in. *Petals* $\frac{3}{4}$ in. *Fruit* 4 by $1\frac{1}{2}$ in. *Seeds* $\frac{3}{8}$ in., packed in a fibrous almost juiceless pulp.—This is one of the three species included in *Herpetospermum* by J. Hooker in Gen. Pl. i. 834.

5. **HERPETOSPERMUM,** *Wall.*

Extensively scandent, tendrils 2–3-fid. *Leaves* long-petioled, cordate, ovate, little lobed. *Flowers* large, yellow, diœcious; males frequently two peduncles from one axil, one early deciduous 1-flowered the other racemose without bracts; females solitary on very short peduncles. MALE: calyx-tube elongate, cylindric at the base, above narrow funnel-shaped; teeth 5, long, linear; petals 5, elliptic, nearly separate, entire; stamens 3; anthers connate, included, one 1-celled, two 2-celled, cells conduplicate. FEMALE: calyx and corolla as in the male; ovary oblong, 3-celled, style long, with three oblong bifid stigmatic lobes; ovules pendulous, 4–6 in each cell. *Fruit* broad-oblong, narrowed at both ends, 3-angular, irregularly sinuate-costate, valves 3 separating from the axis nearly to the base. *Seeds* in two rows in each cell, flat, oblong, pendulous, the lower end corrugate or almost 3-lobed.

1. **H. caudigerum,** *Wall. Cat.* 6761. Bryonia? pedunculosa, *Seringe in DC. Prodr.* iii. 306. Rampinia herpetospermoides, *C. B. Clarke in Journ. Linn. Soc.* xv. 130.

TEMPERATE HIMALAYA, from SIMLA and KUMAON to BHOTAN, alt. 5000–8000 ft.; very common in Sikkim. KHASIA MTS.; *Wallich.*

Stem and peduncles more or less pubescent. *Leaves* 4–6 in. long and broad, usually pubescent on both surfaces, serrate, acuminate; petiole 2–4 in. Male *peduncle* 8 in., pedicels 1 in., hairy. *Calyx-tube* 1 in., pubescent without. *Petals* often 1 in. Rudiment of the *ovary* in the male linear, simple. *Fruit* 3 by 1½ in., more or less pubescent. *Seeds* usually 12 sometimes 18, ½ by ¼ and ⅛ in., thick, often exhibiting (when dried) wavy marks on the surface, packed in a fibrous almost juiceless pulp.—Wallich's Khasia specimen exhibits ripe seeds which are very narrow, incised at the lower end so that the middle lobe appears as a spinous tooth. Lady Dalhousie's examples collected at Simla are nearly glabrous with smaller flowers. *Herpetospermum* of *Bth. & Hk. f. Gen. Pl.* i. 834, described from imperfect materials, includes *H. caudigerum*, *Warea tonglensis* and *Edgaria darjeelingensis.* The generic character did not fit *Warea* or *Edgaria* and required emendation as to the ovules and seeds of Wallich's *Herpetospermum.*

6. **LAGENARIA,** *Seringe.*

Large climbers, pubescent, tendrils 2-fid. *Leaves* ovate or orbicular, cordate, dentate; petiole long, with two glands at its apex. *Flowers* large, white, solitary, monœcious or diœcious, the males long- the females short-peduncled. MALE: calyx-tube funnel-shaped subcampanulate, teeth 5 narrow; petals 5, free, obovate; stamens 3; anthers connate, included, one 1-celled, two 2-celled, cells conduplicate; rudiment of ovary 0. FEMALE: calyx and corolla as in the male; ovary oblong, style short with 3 bifid stigmatic lobes; ovules many, horizontal; placentas 3, vertical. *Fruit* large, ultimately thick membranous or almost woody, indehiscent, polymorphous, usually broader upwards. *Seeds* very many, horizontal, compressed, with a marginal groove, smooth.

1. **L. vulgaris,** *Seringe in DC. Prodr.* iii. 299; *W. & A. Prodr.* 341; *Wight Ill.* t. 105*; *Kurz in Journ. As. Soc.* 1877, pt. ii. 100. L. vittata, hispida and idolatrica, *Seringe l. c.* 299. Cucurbita Lagenaria, *Linn.*; *Lamk. Ill.* t. 795; *Roxb. Fl. Ind.* iii. 718; *Wall. Cat.* 6719.—*Rheede Hort. Mal.* viii. t. 5.

Cultivated throughout INDIA.—DISTRIB. Cultivated in the tropics and warm temperate zones of the whole world.

Leaves often 6 in. diam., softly pubescent on both surfaces, more or less 5-angular or 5-lobed. Male *peduncle* often 6 in., female 1 in. *Calyx-tube* $\frac{1}{2}$ in., pubescent. *Petals* 1–2 in. *Fruit* often $1\frac{1}{2}$ ft., in India usually bottle- or dumb-bell-shaped. *Seeds* $\frac{3}{4}$ by $\frac{3}{8}$ and $\frac{1}{8}$ in. thick, with an impressed groove parallel to and near the margin.

7. LUFFA, *Cav.*

Climbers, large or small, pubescent or nearly glabrous; tendrils 2–5-fid. *Leaves* cordate, usually 5-angular or 5-lobed; petiole without glands at its apex. *Flowers* yellow or white, monœcious, males and females often from the same axil; females solitary or panicled, males on long or short racemes or clustered. MALE: calyx-tube top-shaped, lobes 5, triangular or lanceolate; petals 5, obovate; stamens 3, rarely 5, filaments 3 free or connate; anthers exserted free, one 1-celled, the others 2-celled, cells sigmoid often on the margin of the broad connective. FEMALE: calyx-tube shortly produced above the ovary; lobes and corolla as in the male; ovary oblong, style cylindric, stigma 3-lobed; ovules very many, horizontal. *Fruit* large or small, oblong (not spherical), smooth or angular or spinous, ultimately fibrous, not succulent, 3-celled, usually circumsciss near the top. *Seeds* many, oblong, compressed.—DISTRIB. Species 10, in the warmer regions of the Old World several widely cultivated, one indigenous in America.

* *Stamens* 5.

1. **L. graveolens,** *Roxb. Fl. Ind.* iii. 716; male pedicels clustered in the axils without bracts, females often in the same axils 1–3 on the peduncle each 1-bracteate, fruit with numerous soft bristles. *Wall. Cat.* 6752; *Naud. in Ann. Sc. Nat.* ser. 4, xii. 124; *Kurz in Journ. As. Soc.* 1877, pt. ii. 101.

SIKKIM, alt. 1000–2000 ft.; *J. D. H.* RAJMAHAL HILLS; *Roxburgh.* Plain of EAST BENGAL; *C. B. Clarke.* CHITTAGONG; *Kurz.*—DISTRIB. North Australia.

Stems long, little villous; tendrils 3–5-fid. *Leaves* 3 in. diam., reniform-orbicular, 5-angled, denticulate, punctulate, scabrous above, pubescent on the nerves beneath; petiole 2–3 in. Male *pedicels* few, much shorter than the petiole; *petals* 5, $\frac{1}{4}$ in., yellow, entire; stamens 5. Female *peduncle* short, sometimes divided with 2–3 flowers, each pedicel carrying a small ovate entire thick bract $\frac{1}{8}$ in. *Fruit* 2 by 1 in., covered with papillæ, scarcely spinous, obscurely 10-striate, dehiscing horizontally near the top, stopple without papillæ. *Seeds* scarcely $\frac{1}{4}$ in., very many, packed in fibres, smooth, not margined.

2. **L. ægyptiaca,** *Mill. ex Hook. f. in Oliv. Fl. Trop. Afr.* ii. 530; male flowers racemed on long peduncles, fruit elongate clavate smooth 10-ribbed or somewhat 10-angular. *DC. Prodr.* iii. 303. L. pentandra, *Roxb. Fl. Ind.* iii. 712; *W. & A. Prodr.* 343; *Wall. Cat.* 6751; *Wight. Ic.* t. 499. L. racemosa, *Roxb. l. c.* 715. L. clavata, *Roxb. Hort. Beng.* 104, *Fl. Ind.* iii. 714. L. acutangula, *W. & A. l. c., not of Roxb.* L. cylindrica, *Roem. Synops.* ii. 63; *Naud. in Ann. Sc. Nat.* ser. 4, xii. p. 119; *Kurz in Journ. As. Soc.* 1877, pt. ii. 100. L. Petola and Cattu-picinna, *Seringe in DC. l. c.* L. Parvala, *Wall. Cat.* 6758. L. Gosa, hederacea and Satpatia, *Wall. Cat.* 6753, 6755, 6757. Bryonia cheirophylla, *Wall. Cat.* 6715 A. Momordica Luffa, *Linn.*—*Rheede Hort. Mal.* viii. t. 8, *with many other synonyms for which see Naudin l. c.*

Thoughout INDIA very common, often cultivated.—DISTRIB. Cultivated throughout the tropics, native country uncertain (Naudin).

Extensively climbing hairy; tendrils 2–3-fid. *Leaves* 4 in. diam., reniform-orbicular, 5-angled or somewhat 5-lobed, dentate, usually scabrous, punctate on both surfaces, pubescent on the nerves beneath; petiole 2 in. Male *peduncle* 6 in., flowers often approximate near the summit; pedicels short, each carrying a small ovate viscid entire bract sometimes obsolete. *Petals* 5, $\frac{3}{4}$–1 in., yellow, often with elevated hairy green veins. *Stamens* 5. Female *flower* solitary, peduncle 1–3 in. *Fruit* 5–12 in. *Seeds* $\frac{3}{8}$ by nearly $\frac{1}{4}$ in., usually black, very narrowly winged, smooth or very sparingly tubercled.—The pedicels are rarely elongated (*L. Satpatia, Wall.*); one example of Falconer's has the racemes compound. The fruit being the part eaten and attended to in cultivation is hence very variable: and no good character founded on it can be drawn between this species and *L. acutangula*.

** *Stamens* 3.

3. **L. acutangula,** *Roxb. Fl. Ind.* iii. 713; fruit elongate 10-angled not covered by spines or papillæ. *DC. Prodr.* iii. 302; *Wall. Cat.* 6759; *Hook. f. in Oliv. Fl. Trop. Afr.* ii. 530, *excl. syn.*; *Kurz in Journ. As. Soc.* 1877, pt. ii. 101, *excl. many syn.* Cucumis acutangulus, *Wall. Cat.* 6736.

North-West India; *Royle.* Sikkim; *J. D. H.* Assam; *Masters.* Plain of East Bengal; *C. B. Clarke.* Ceylon; *Thwaites.*—Distrib. Malaya.

Very near *L. pentandra* from which it differs by having 3 stamens as noted by Roxburgh and verified by *Thwaites.* The fruit is usually smaller, often only 3–4 in.—The figure of *L. fœtida* in Cav. Ic. i. t. 9, shows clearly 5 stamens and is not Roxburgh's plant. *Rheede Hort. Mal.* viii. t. 7, is much more probably *L. ægyptiaca* than this species. *L. acutangula* No. 1106 *in Herb. Wight* is pentandrous and is *L. ægyptiaca* exactly. All these, and all descriptions founded on them, are not here included in *L. acutangula, Roxb.*

Var. *amara*, Roxb. Fl. Ind. iii. 715 (sp.); fruit oblong 10-angled without spines or papillæ. *Wall. Cat.* 6754 A; *W. A. Prodr.* 343; *Dalz. & Gibs. Bomb. Fl.* 102; *Naud. in Ann. Sc. Nat.* ser. 4, xii. 123. L. Plukenetiana, *DC. Prodr.* iii. 302. Momordica tubiflora, *Wall. Cat.* 6749.—From nearly all India especially the Western side. Naudin, who retains *L. amara* as a species, says it is "exceedingly near *L. acutangula* but distinguished by the leaves a little smaller and sometimes whitish." The typical *L. amara* has the leaves softly pubescent at least while young, for they become in age scabrous.

4. **L. echinata,** *Roxb. Hort. Beng.* 104; *Fl. Ind.* iii. 716; fruit ellipsoid densely covered with bristles. *Wall. Cat.* 6756; *W. & A. Prodr.* 343; *Dalz. & Gibs. Bomb. Fl.* 102; *Kurz in Journ. As. Soc.* 1877, pt. ii. 101. L. Bindaal, *Roxb. Hort. Beng.* 104; *Fl. Ind.* iii. 717.

Gujerat; *Dalzell.* Scinde; *Stocks.* Purneah (Bengal); *Kurz.* Dacca; *C. B. Clarke.*—Distrib. Tropical Africa.

Climbing not extensively, sparingly scabrous-pilose; tendrils 2-fid. *Leaves* 1–2 in. diam., cordate, reniform-orbicular, entire or obscurely 5-angular or 5-lobed, or cut almost to the base into 5 narrow sinuate-pinnatifid segments, dentate; petiole 1–2 in. Male *peduncles* normally paired, one 1-flowered the other racemed very long 6 in. or more, pedicels 1 in.; flowers small, white, without bracts. *Filaments* 3, two with 2-celled anthers. *Peduncle* of the solitary female very short. *Fruit* $1\frac{1}{4}$ by $\frac{4}{5}$ in., ribs not visible; spines $\frac{1}{4}$ in., ciliate; stopple without spines, calyx-teeth persistent. *Seeds* $\frac{1}{5}$ in., many, slightly scabrous.

Var. *longistylis*, Edgw. in Journ. As. Soc. 1852, p. 270 (sp.); male raceme shorter than the leaves, spines of the fruit fewer themselves glabrous.—Banda, *Edgeworth.*—The leaves are not more dissected than in some Bengal typical *L. echinata*, nor are the styles longer. The whole male raceme is much shorter than the accompanying 1-flowered male peduncle.

5. **L. Kleinii,** *W. & A. Prodr.* 344; young fruit spinous, spines densely woolly. L. umbellata, *Roem. Synops.* ii. 63. Cucurbita umbellata, *Heyne in Herb. Rottler*; *Wall. Cat.* 6724; *DC. Prodr.* iii. 318.

TRAVANCORE; *Klein.* COROMANDEL (?) Wight.

Agrees closely with *L. echinata* and may be a variety of it, but the *stamens* differ; the filaments being three, of which two are bifid below the anthers.

8. BENINCASA, *Savi.*

A large climber, softly hairy, tendrils 2-fid. *Leaves* cordate, reniform-orbicular, more or less 5-lobed; petiole without glands. *Flowers* large, yellow, monœcious, all solitary, without bracts. MALE: calyx-tube campanulate, lobes 5, leaf-like, serrate; petals 5, nearly separate, obovate; stamens 3, inserted near the mouth of the tube; anthers exsert, free, one 1-celled, two 2-celled, cells sigmoid. FEMALE: calyx and corolla as in the male; ovary oblong, densely hairy; style thick, with 3 flexuose stigmas; ovules numerous, horizontal; placentas 3. *Fruit* large, fleshy, oblong, pubescent, indehiscent. *Seeds* many, oblong, compressed, margined.

1. **B. cerifera,** *Savi*; *DC. Prodr.* iii. 303; *W. & A. Prodr.* 344; *Miq. Fl. Ind. Bat.* i. pt. i. 665; *Naud. in Ann. Sc. Nat.* ser. 4, xii. 87; *Kurz in Journ. As. Soc.* 1877, pt. ii. 101. Cucurbita Pepo, *Lour. Fl. Cochinc.* 593; *Roxb. Fl. Ind.* iii. 718. C. hispida, *Wall. Cat.* 6723. C. farinosa, *Blume Bijd.* 931. Gymnopetalum ? calyculatum, *Miq. Fl. Ind. Bat. Suppl.* 332.—*Rheede Hort. Mal.* viii. t. 3.

Throughout INDIA cultivated.—DISTRIB. Cultivated in Malaya, China, Japan, Tropical Africa; where wild uncertain.

Leaves 4–6 in. diam.; petiole 3–4 in. Male *peduncle* 3–4 in., female peduncle 1–2 in. *Calyx-teeth* when young often narrow, scarcely serrate. *Fruit* 1–1½ ft., cylindric, without ribs, hairy, ultimately covered with a waxy bloom. *Seeds* ½ by ⅓ in.

9. MOMORDICA, *Linn.*

Climbing, with simple tendrils. *Leaves* cordate, petioled, undivided in the Indian species. *Flowers* yellow or white, monœcious or diœcious, females solitary peduncled, males solitary or racemed, bracteate or not. MALE: calyx-tube short, campanulate (with 2–3 basal oblong incurved scales ex Hook. f.) lobes 5; *corolla* 5-partite nearly to the base; stamens 3 (2 in *M. Cymbalaria*); filaments short; anthers at length free, one 1-celled, one or two 2-celled, cells conduplicate, or in *M. Cymbalaria* horse-shoe-shaped. FEMALE: calyx and corolla as in the male; ovary oblong; style long, stigmas 3; ovules very many, horizontal placentas 3. *Fruit* oblong or spherical, rough or smooth, indehiscent or 3-valved, many- or few-seeded. *Seeds* obovate or complanate, smooth corrugate or sculptured.—DISTRIB. Species 26, chiefly in the warmer parts of Africa, several in Tropical Asia, few in Tropical America.—The genus is here artificially separated from *Luffa* by its simple tendrils.

* *Male peduncles 1-flowered.*

1. **M. Charantia,** *Linn.*; *DC. Prodr.* iii. 311; monœcious, bract about the middle of the male peduncle orbicular entire, fruit ovoid narrowed to both ends many-ribbed covered with triangular tubercles. *Roxb. Fl. Ind.* iii. 707;

Wall. Cat. 6746; *W. & A. Prodr.* 348; *Bot. Mag.* t. 2455; *Miq. Fl. Ind. Bat.* i. pt. i. 663; *Wight Ic.* t. 504; *Dalz. & Gibs. Bomb. Fl.* 102; *Naud. in Ann. Sc. Nat.* ser. 4, xii. 131; *Kurz in Journ. As. Soc.* 1877, pt. ii. 102. M. humilis, *Wall. Cat.* 6747. M. muricata, *DC. l. c.*; *Roxb. l. c.*; *Wall. Cat.* 6745; *Miq. l. c.* M. senegalensis, *Lamk.*; *DC. l. c.* Cucumis africanus, *Bot. Reg.* t. 980.—*Rheede Hort. Mal.* viii. t. 9, 10.

Throughout INDIA, cultivated.—DISTRIB. Malaya, China, Tropical Africa.

Leaves 1–3 in. diam., orbicular, glabrous or slightly pubescent, cut nearly to the base into 5–7 narrow sinuate or subpinnatifid lobes. Male *peduncle* 2–4 in., slender, bract. *Calyx-lobes* ovate, acute. *Petals* $\frac{3}{8}$–$\frac{3}{4}$ in., yellow. Female *peduncle* 2–4 in., slender, bracteate near the base; ovary fusiform, muricate. *Fruit* 1–3 in., rostrate. *Seeds* $\frac{1}{3}$ in., compressed, corrugate on the margin, somewhat sculptured.

2. **M. Balsamina,** *Linn.*; *DC. Prodr.* iii. 311; monœcious, bract very near the top of the male peduncle orbicular denticulate variegated, fruit ovoid narrowed to both ends smooth. *Miq. Fl. Ind. Bat.* i. pt. i. 664; *Boiss. Fl. Orient.* ii. 757, *excl. syn. Wight*; *Hook. f. in Oliv. Fl. Trop. Afr.* ii. 537, *not of Wallich, nor of W. & A. Prodr.* 349.

PUNJAB; *T. Thomson, Edgeworth.* NORTH-WEST INDIA; *Royle.* SCINDE; *Stocks.*—DISTRIB. Malaya, Australia, Western Asia, Africa to the Cape.

Glabrous or nearly so. *Leaves* 1½–3 in. diam., orbicular, palmately 3–5-lobed to about the middle, lobes acutely lobulate, punctulate on both surfaces; petiole ¾–1½ in. Male *peduncle* 1–3 in.; calyx-lobes ovate or oblong, acute; petals ¼–½ in., yellowish, black at the base. Female *peduncle* short, less than ½ in., ebracteate. *Fruit* 1–3 in., rostrate, red, usually quite smooth, in the example of Edgeworth's obscurely ribbed and slightly muricate. *Seeds* $\frac{1}{3}$ in., compressed, nearly smooth.

3. **M. dioica,** *Roxb. Fl. Ind.* iii. 709; diœcious, petiole without glands, bract near the top of the male peduncle, flowers large yellow, fruit densely covered with soft spines. *DC. Prodr.* iii. 312; *W. & A. Prodr.* 348; *Wight Ic.* tt. 505, 506; *Dcne. in Jacq. Voy. Bot.* t. 71; *Dalz. & Gibs. Bomb. Fl.* 102; *Naud. in Ann. Sc. Nat.* ser. 4, xii. 133; *Thwaites Enum.* 126, *as to var. a.*; *Kurz in Journ. As. Soc.* 1877, pt. ii. 102. M. Balsamina, *Wall. Cat.* 6741; *W. & A. Prodr.* 349, *not of others.* M. Wallichii, *Roem. Synops.* ii. 58; *Miq. Fl. Ind. Bat.* i. pt. i. 664. M. renigera, Hamiltoniana, and Heyneana, *Wall. Cat.* 6743, 6744, 6748. M. Missionis, *Wall. Cat.* 6739; *Dennst. in Miq. l. c.* M. subangulata, *Blume ex Kurz in Journ. As. Soc.* 1877, pt. ii. 102. Trichosanthes Russeliana, *Wall. Cat.* 6696. Bryonia grandis, *Wall. Cat.* 6700 L.

Throughout INDIA, from the HIMALAYA to CEYLON and SINGAPORE, ascending to 5000 ft. alt. on the hills.—DISTRIB. Malaya.

Leaves 2–4 in. long and broad, cordate, ovate, acute, entire, denticulate or more or less 3–5-lobed, glabrous, often punctate beneath; petiole 1–2 in. Male *peduncle* 2–6 in.; bract large, cowl-like, embracing the expanded flower, glabrous, thin or (in *M. Missionis*) thick soft pubescent; calyx-lobes oblong with a narrow termination; petals 1 in., full-yellow, the two 2-anthered filaments 2-fid half way down. Female *peduncles* as long as the male, bract small usually near the base. *Fruit* 1–3 in., ellipsoid, acute, without ribs. *Seeds* nearly ½ in., many, compressed, broad-oblong, with a few well-marked corrugations on the margins, nearly smooth on the surface.—The large succulent Lower Bengal form cannot well be confounded with any other; but both from the Deccan Peninsula and Punjab there is a much slenderer form, the males of which have been referred to *M. Balsamina* (the intense spinousness of the young ovary prevents the female plants being mistaken): they usually have the leaves much less dissected, and *M. Balsamina* almost invariably exhibits both male and female flowers on the same branch. *M. Missionis, Wall.*, is the slender form

with a glabrous small bract to male flower: *M. renigera, Wall.* has a large woolly bract: *M. Heyneana, Wall.* has the leaves deeply 3-lobate: *M. Hamiltoniana, Wall.* has the bract foliaceous crumpled serrate. *M. Balsamina, Wall.* is the typical *M. dioica, Roxb.* Thwaites' *M. dioica β denudata* is altogether remote from *M. dioica* (*see No.* 5).

4. **M. cochinchinensis,** *Spreng. Syst.* iii. 14; diœcious, petioles glandular, bract near the top of the male peduncle, flowers large white, fruit muricated, seeds large. *Kurz in Journ. As. Soc.* 1877, pt. ii. 102. M. mixta, *Roxb. Fl. Ind.* iii. 709; *W. & A. Prodr.* 349; *Miq. Fl. Ind. Bat.* i. pt. i. 664; *Bot. Mag.* t. 5145; *Naud. in Ann. Sc. Nat.* ser. 4, xii. 132. M. dioica, *Wall. Cat.* 6750 A, B, C, D, E, F. Muricia cochinchinensis, *Lour. Fl. Cochinch.* 733; *DC. Prodr.* iii. 318.

Bengal to Tenasserim, common. Deccan Peninsula; *Wight.* Canara; *Law.*—Distrib. Formosa, Philippines.

Leaves 4–5 in. diam., cordate, ovate, usually 3-lobed, glabrous or a little pubescent, often punctate beneath, little dentate; petiole 2–3 in., almost invariably glandular on its middle as well as apex. Male *peduncle* 2–6 in., bract often pubescent, embracing the expanded flower; petals 1–2 in., white tinged with yellow, 3 with black spots at the base 2 with yellow glands; the two 2-anthered filaments not 2-fid. Female *peduncle* 1–2 in., bract small about the middle. *Fruit* 4–5 in., ovate, pointed, bright red, very fleshy, without ribs, covered with conical points nearly $\frac{1}{8}$ in. high. *Seeds* $\frac{1}{8}$ by $\frac{5}{8}$ and $\frac{1}{5}$ in. thick, many, horizontal, irregular, ovate, compressed, black, corrugated on the margins, sculptured on the faces.

** *Male peduncles several-flowered.*

5. **M. denudata,** *Thwaites Enum.* 126; diœcious, leaves ovate-lanceolate, flowers small, many males on one raceme with inconspicuous bracts, filaments 3, anthers conduplicate, fruit ovoid rostrate muricated with triangular papillæ.

Ceylon; alt. 3000–4000 ft.; *Gardner, Thwaites, Walker.*

Slender, climbing, nearly glabrous; tendrils simple. *Leaves* 2–4 by 1–2 in., deeply cordate, often 3–5-angled or sparingly 3–5-lobed, central lobe always long acute; petiole 1 in. Male *peduncle* 2 in., often somewhat panicled nearly from the base and 10–20 mostly pedicelled flowered; bracts at the base of the pedicels minute; sepals ovate, acuminate; petals $\frac{1}{5}$–$\frac{1}{3}$ in.; filaments inserted near the top of the calyx-tube, anthers much exsert. Female *peduncle* 1-flowered, about as long as the male, bract minute near the middle. *Fruit* $\frac{3}{4}$ in. long and broad, suddenly rostrate.

This species is evidently closely allied to the next which Sir J. Hooker removed from *Luffa* (where Roxburgh placed it) because of its simple tendrils. But the exsert anthers, the shape of the flowers and their being pedicelled, all ally *M. denudata* and *M. Cymbalaria* with *Luffa* rather than *Momordica.*

6. **M. Cymbalaria,** *Fenzl in Pl. Kotschy,* No. 147; monœcious, leaves reniform-orbicular, flowers small, males few on one raceme with inconspicuous bracts, filaments 2, anthers horseshoe-shaped, fruit obovate-oblong acute 8-ribbed smooth. *Hook. f. in Oliv. Fl. Trop. Afr.* ii. 540. Luffa tuberosa, *Roxb. Hort. Beng.* 104; *Fl. Ind.* iii. 717; *W. & A. Prodr.* 344. L. amara, *Wall. Cat.* 6754 B.

Deccan Peninsula; *Wight.* Mysore; *Heyne.* Concan; *Stocks.*—Distrib. Tropical Africa.

Root a large woody tuber as in many others of the genus. *Leaves* 1–2 in. broad, 5-angular or slightly 5-lobed, middle lobe not elongated, glabrous or slightly pubescent, often punctulate on both surfaces, dentate; petiole $\frac{1}{2}$–$1\frac{1}{2}$ in. Male *raceme* 1–2 in., with usually only 2–4 flowers; calyx-lobes lanceolate; petals $\frac{1}{4}$ in., yellow; filaments 2,

one 2-fid one 3-fid so each with one anther-cell; filaments inserted near the top of the calyx-tube, anthers completely exsert. Female *peduncle* ¾–2 in., 1-flowered, ebracteate. *Fruit* ¾ by scarcely ¼ in. *Seeds* ⅛–¼ in., few, shortly obovoid, smooth, shining.

10. CUCUMIS, *Linn.*

Climbing herbs, hispid or scabrous; tendrils simple. *Leaves* petioled, palmately 3–7-lobed or 5-angled or entire, dentate or serrate. *Flowers* yellow, monœcious, males clustered in the axils, females solitary, all shortly peduncled. MALE: calyx-tube top-shaped or campanulate, lobes 5. *Stamens* 3; anthers free, one 1-celled, two 2-celled, cells conduplicate or much flexuose, connective produced in a crest. FEMALE: calyx and corolla as in the male; ovary ovoid, style short, with three obtuse stigmas; ovules very many, horizontal; placentas 3. *Fruit* fleshy, indehiscent, large or small, spherical or elongate, smooth or tuberculate. *Seeds* very many, oblong, compressed, mostly smooth.—DISTRIB. Species 25, of which half are African, a few in the tropical regions of Asia, Australia and America, and several widely cultivated of doubtful origin.

1. **C. trigonus,** *Roxb. Fl. Ind.* ii. 722; leaves and petioles scabrid not softly hairy, petioles ¼–⅜ in., flowers small, ovary hairy sometimes densely white woolly or silky, fruit about 1½ in. ultimately glabrous ellipsoid or obovoid round or obscurely trigonous. *W. & A. Prodr.* 342; *Wight Ic.* t. 497; *Wight Ill.* t. 105; *Boiss. Fl. Orient.* ii. 758; *Dalz. & Gibs. Bomb. Fl.* 103; *Naud. in Ann. Sc. Nat.* ser. 4, xi. 30. C. turbinatus, *Roxb. Fl. Ind.* iii. 723; *W. & A. Prodr.* iii. 342; *Miq. Fl. Ind. Bat.* i. pt. i. 671. C. maderaspatanus, *Roxb. l. c.* 723; *Wall. Cat.* 6734. C. Melo var. agrestis, *Naud. l. c.* 73. C. pubescens, *Wall. Cat.* 6729; *W. & A. Prodr.* 342; *Royle Ill.* t. 47; *Wight Ic.* t. 496; *Dalz. & Gibs. Bomb. Fl.* 103, *perhaps not of Willd. and others.* C. pseudo-colocynthis, *Royle Ill.* t. 47. C. eriocarpus, *Boiss. Diagn.* ii. 59. Bryonia callosa, *Herb. Rottler*; *Wall. Cat.* 6710.

Throughout INDIA.—DISTRIB. Malaya, North Australia, Afghanistan, Persia.

Root perennial, by which character alone it can be distinguished from *C. Melo* according to Naudin, but the examples seen and collected in India are almost invariably less than one year old. *Stem* in the typical examples scabrid; tendrils short. *Leaves* 1–2 in. diam., orbicular subpentangular, in the typical plant deeply palmate-lobed, lobes very scabrid and often narrow; in the more flaccid *C. pubescens* the hairs more scattered, the leaves entire, 5-angled 5-lobed; petiole ½–1½ in. *Peduncles* of males and females ½–1 in. *Fruit* sometimes with a few scattered hairs, often with 10 stripes.—The plants marked by Indian botanists as *C. pubescens* are reduced to *C. trigonus* by Naudin in the Kew Herbarium. Kurz (in Journ. As. Soc. 1877, pt. ii. 103) separates *C. trigonus* with solitary peduncles from *C. pubescens* with clustered peduncles and makes the latter a variety of *C. Melo, Linn.* *C. pubescens* of *Thwaites Enum.* (C.P. 3534) has remarkably acute lobes to the leaves and resembles *C. Hardwickii,* but there is no note of the fruit.

2. **C. prophetarum,** *Linn.*; *DC. Prodr.* iii. 301; leaves and petioles scabrid not softly downy, flowers small, petals ¼ in., ovary very tuberculate, fruit about 1 in. more or less tuberculate ellipsoid. *Wall. Cat.* 6733; *W. & A. Prodr.* iii. 342; *Boiss. Fl. Orient.* ii. 758; *Naud. in Ann. Sc. Nat.* ser. 4, xi. 14.

SCINDE; *Stocks.*—DISTRIB. Beloochistan, Arabia, Tropical Africa to Guinea.

Stem scabrid; tendrils short. *Leaves* 1–1½ in., reniform, subtriangular, much lobed; petiole ½–1 in. Female *peduncle* less than ½ in., stout. *Fruit* green, with paler vertical stripes.

3. **C. Melo,** *Linn.*; *DC. Prodr.* iii. 300; leaves orbicular-reniform 5-angular or lobed lobes neither deep nor acute scabrid on both surfaces and also often with soft hairs, petals ⅝ in., fruit glabrous or somewhat hairy not spinous nor tuberculate. *Roxb. Fl. Ind.* iii. 720; *Wall. Cat.* 6738; *W. & A. Prodr.* 341; *Jacq. Monog. du Melon*, t. 1–33. C. utilissimus, *Roxb. l. c.* 721; *Wall. Cat.* 6731; *W. & A. Prodr.* 342. C. flexuosus, *Linn.*; *DC. l. c.*; *W. & A. Prodr.* iii. 342. C. maculatus, *Willd.*; *DC. l. c.* 301; *W. & A. Prodr.* iii. 342. C. Gurmia and C. Chata, *Wall. Cat.* 6726? and 6727. C. cicatrisatus, *Stocks in Hook. Kew Journ. Bot.* iv. 148.

Throughout INDIA, cultivated.—DISTRIB. Cultivated in most hot countries, and perhaps the cultivated form of *C. trigonus.*

Stems scabrous. *Leaves* 3 in. diam.; petiole 2 in. Female *peduncle* sometimes 2 in. *Fruit* spherical ovoid elongate or contorted.—The *Melon.*

4. **C. sativus,** *Linn.*; *DC. Prodr.* iii. 300; leaves ovate 5-angular or slightly lobed, lobes acute hispidulous on both surfaces and also often with soft hairs, petals ⅝ in., fruit glabrous sometimes tuberculated commonly elongate. *Lamk. Ill.* t. 795; *Roxb. Fl. Ind.* iii. 720; *Wall. Cat.* 6737; *W. & A. Prodr.* 342; *Miq. Fl. Ind. Bat.* i. pt. i. 671; *Naud. in Ann. Sc. Nat.* ser. 4, xi. 27; *Kurz in Journ. As. Soc.* 1877, pt. ii. 103. C. muricatus, *Wall. Cat.* 6735 A. C. Hardwickii, *Royle Ill.* t. 47.—*Rheede Hort. Mal.* t. 6.

Throughout INDIA, cultivated.—DISTRIB. In all warm and warm temperate countries, cultivated; where wild unknown.

Stems scabrous. *Leaves* 3–5 in. diam.; petiole 2–3 in. Female *peduncle* sometimes 2 in. Young *ovary* muricate with rigid prickles. *Fruit* commonly cylindric, 12 by 1½ in.—The *Cucumber.*

VAR. *sikkimensis*, Hook. f. Bot. Mag. t. 6206; fruit 15 by 6 in. clavate with 5 placentas. Concombre du Sikkim, *Naud. in Ann. Sc. Nat.* ser. 4, xi. 28. Cultivated in Nipal and Sikkim, *J. D. H.*, &c.

11. CITRULLUS, *Schrader.*

Climbing herbs, hispid or scabrous; tendrils 2–3-fid. *Leaves* petioled, palmately 3–7-lobed, usually deeply with narrow sinuate-pinnatifid segments, but sometimes little lobed. *Flowers* monœcious, all solitary, tolerably large. MALE: calyx-tube campanulate, lobes 5; stamens 3, short; anthers scarcely cohering, one 1-celled, two 2-celled, cells conduplicate, connective not produced FEMALE: calyx and corolla as in the male; ovary ovoid; style short, stigmas 3, reniform; ovules very many, horizontal; placentas 3. *Fruit* globose or ellipsoid, smooth, fleshy, indehiscent. *Seeds* very many, oblong, compressed, smooth. —DISTRIB. Species 2, widely cultivated.

1. **C. Colocynthis,** *Schrad. in Linnæa* 1838, 414; leaves deeply divided harshly scabrid, fruit globose rarely 3 in. diam. intensely bitter. *Arn. in Hook. Journ. Bot.* iii. 276; *Wight Ic.* t. 498; *Miq. Fl. Ind. Bat.* i. pt. i. 662; *Naud. in Ann. Sc. Nat.* ser. 4, vol. xii. 99; *Dalz. & Gibs. Bomb. Fl.* 101; *Boiss. Fl. Orient.* ii. 759. Cucumis Colocynthis, *Linn.*; *DC. Prodr.* iii. 302; *Roxb. Fl. Ind.* iii. 719; *Wall. Cat.* 6732; *W. & A. Prodr.* iii. 342.

Throughout INDIA, cultivated and also very often apparently wild.—DISTRIB. Western Asia, Arabia, all Africa except the Cape, Spain.

Whole plant scabrid. *Leaves* 2½ by scarcely 2 in. in the typical wild very scabrous form, larger in the cultivated forms approaching *C. vulgaris*, ovate, middle segment compound-pinnatifid; petiole 1 in. *Petals* ½ in., obovate, light yellow. *Ovary* villous. *Fruit* smooth, variegated green and white. *Seeds* ⅙–¼ in., not margined.

2. **C. vulgaris,** *Schrad. in Linnæa* 1848, 412; leaves deeply divided or but moderately lobed glabrous or somewhat hairy hardly scabrid, fruit often 10 in. diam. sometimes much smaller. *Naud. in Ann. Sc. Nat.* ser. 4, xi. 100; *Dalz. & Gibs. Bomb. Fl.* 102; *Kurz in Journ. As. Soc.* 1877, pt. ii. 103. C. fistulosus, *Stocks in Hook. Kew Journ. Bot.* iii. t. 3. Cucumis Citrullus, *DC. Prodr.* iii. 301. Cucurbita Citrullus, *Linn.*; *Roxb. Fl. Ind.* iii. 319; *Wall. Cat.* 6717; *W. & A. Prodr.* 351.

Throughout INDIA, cultivated.—DISTRIB. In all warm countries of the world, cultivated.

Said to be annual while *C. Colocynthis* is perennial; but the distinction between the cultivated form of *C. Colocynthis* and the divided-leaved forms of the water-melon is very small. The water-melon has either sweet or bitter fruit: when the latter, it is *Citrullus amarus* of authors.—*C. fistulosus, Stocks,* has thick stems, leaves sparingly lobed, and is plentifully supplied with long somewhat hispid hairs.—The *Water-Melon.*

12. CEPHALANDRA, *Schrader.*

Climbing herbs, scarcely hairy; tendrils simple. *Leaves* petioled, 5-angular or 5-lobed, toothed. *Flowers* diœcious, moderately large, all solitary and white in the Indian species, ebracteate. MALE: calyx-tube campanulate, short, limb 5-lobed; corolla campanulate, 5-lobed about half-way down; stamens 3; anthers exsert, connate, one 1-celled, two 2-celled, cells conduplicate. FEMALE: calyx and corolla as in the male; ovary oblong, style long with 3 bifid stigmas; ovules many, horizontal; placentas 3, vertical. *Fruit* fleshy, indehiscent, cylindric, smooth. *Seeds* many, ovoid, compressed, margined.—DISTRIB. Species 12; all African, one extending to India and Malaya.

1. **C. indica,** *Naud. in Ann. Sc. Nat.* ser. 5, v. 16; leaves 5-angular occasionally 5-lobed, fruit 1–2 by ½–1 in. *Kurz in. Journ. As. Soc.* 1877, pt. ii. 103. Momordica monadelpha, *Roxb. Fl. Ind.* iii. 708. Bryonia grandis, *Linn. f. Suppl.* 126; *Wall. Cat.* 6700, *except* D, I, K, L. B. palmata, *Wall. Cat.* 6711 A, B, C. Coccinia indica, *W. & A. Prodr.* 347; *Wight Ill.* t. 105; *Dcne. in Jacq. Voy. Bot.* t. 72; *Hook. Ic. Pl.* t. 138; *Miq. Fl. Ind. Bat.* i. pt. i. 673; *Dalz. & Gibs. Bomb. Fl.* 103. C. Schimperi, *Naud. l.c.* ser. 4, xii. 16. C. Wightiana, *Roem. Synops.* ii. 93; *Miq. l.c.* 674.—*Rheede Hort. Mal.* viii. t. 14.

Throughout INDIA, common.—DISTRIB. Malaya, Africa.

Leaves 2–4 in. diam., 5-angular, papillose, seabrid; petiole 1 in. MALE: peduncle 1 in., jointed below the flower; calyx-lobes linear-oblong; corolla nearly 1 in., lobes long-triangular. Female *peduncle* about ¼ in. *Ovary* smooth. *Fruit* bright scarlet.

VAR. *palmata,* W. & A. Prodr. 348; leaves deeply lobed segments sometimes narrow and sinuate. B. alceæfolia, *Herb. Rottler.*—Principally in the Deccan Peninsula. *Hook. f. in Oliv. Fl. Trop. Afr.* ii. 551 keeps *C. quinqueloba* (*Schrad. in Eckl. & Zeyh. Enum.* 280) distinct from this var., but it is not easy to do so.—Whether this plant is *Bryonia grandis, DC. Prodr.* iii. 305 with aculeate fruit, or *B. Mormoi* of the same work, also said to have aculeate fruit, is perhaps now not material.

13. CUCURBITA, *Linn.*

Large climbing herbs, hispid or hairy; tendrils 2–4-fid. *Leaves* petioled, cordate, ovate, 5-angular or lobed. *Flowers* monœcious, all solitary, yellow, very large. MALE: calyx-tube campanulate, lobes 5, linear or foliaceous; corolla

campanulate, 5-lobed hardly half-way down; stamens 3, inserted low in the calyx-tube, anthers connate, one 1-celled, two 2-celled, cells conduplicate. FEMALE: calyx and corolla as in the male; ovary oblong, style short, stigmas 3, bifid; ovules very many, horizontal; placentas 3. *Fruit* fleshy, indehiscent, often large. *Seeds* ovoid or oblong, compressed, margined or not.—DISTRIB. Species 5, whereof 4 are cultivated, 1 is said to be wild in Africa.

1. **C. maxima,** *Duchesne in Lamk. Dict.* ii. 151; leaves with 5 shallow lobes or subentire sinus between the lobes narrow, hairs of the petiole equal not pungent, calyx-segments lanceolate-linear, fruiting peduncle stout corky striated not grooved. *DC. Prodr.* iii. 316; *Wall. Cat.* 6720; *Naud. in Ann. Sc. Nat.* ser. 4, vi. 17.

Throughout INDIA, cultivated.—DISTRIB. Cultivated in all warm and temperate parts of the globe.

Annual. *Leaves* 4–6 in. diam., hispidulous and also with much soft hair, denticulate; petiole often nearly as long as the blade. Male *peduncle* 4 in., female 1½ in. *Corolla* 3–4 in.—The *Common Gourd.*

2. **C. moschata,** *Duchesne*; *DC. Prodr.* iii. 317; hairs of the petiole equal not pungent, calyx-segments spathulate or foliaceous. *Naud. in Ann. Sc. Nat.* ser. 4, vi. 47; *Kurz in Journ. As. Soc.* 1877, pt. ii. 104. C. maxima, *W. & A. Prodr.* 351; *Wight Ill.* t. 105; *Wight Ic.* t. 507. C. Melopepo, *Roxb. Fl. Ind.* iii. 719; *Wall. Cat.* 6725. C. Camolenga, *Wall. Cat.* 6718.—*Rheede Hort. Mal.* viii. t. 2.

Throughout INDIA, cultivated.—DISTRIB. Widely cultivated in tropical and subtropical regions.—The *Musk-Melon.*

3. **C. Pepo,** *DC. Prodr.* iii. 317; leaves 5-lobed sinus between the lobes broad, hairs on the petiole beneath rigid almost prickly, fruiting peduncle woody strongly grooved. *Roxb. Fl. Ind.* iii. 718; *W. & A. Prodr.* 351; *Naud. in Ann. Sc. Nat.* ser. 4, vi. 29; *Wall. Cat.* 6722.

Throughout INDIA, cultivated.—DISTRIB. Cultivated in all warm and temperate parts of the globe.

Annual. *Leaves* 4–6 in. diam., with much soft hair, hispidulous on the nerves beneath, denticulate, lobes acute often slightly lobed; petiole often nearly as long as the blade. Male *peduncle* 4 in. or more, female 1½ in. *Corolla* 3–4 in.—The *Pumpkin.*

14. BRYONIA, *Linn.*

Climbing herbs, scabrid or glabrous; tendrils 2-fid in the Indian species. *Leaves* petioled, palmately 5-lobed or 3–5-angular. *Flowers* small, yellowish, males and females clustered in the same axils (in the Indian species shortly pedicelled). MALE: calyx-tube widely campanulate, 5-toothed; corolla 5-partite; stamens 3, inserted low down the calyx-tube, anthers free, two 2-celled one 1-celled; cells curved or somewhat sigmoid, never quite conduplicate, connective not produced; rudiment of ovary 0. FEMALE: calyx and corolla as in the male; ovary ovoid; style slender, 3-fid at the top, no disc at the base in the Indian species; ovules many, horizontal, placentas 3. *Berry* spherical, indehiscent. *Seeds* not very many, oblong or ovoid, compressed.—DISTRIB. Species 12, in the warm and temperate regions of the old world.

1. **B. laciniosa,** *Linn.*; *DC. Prodr.* iii. 308; scabrous or nearly glabrous, leaves generally deeply palmately 5-lobed sinus sometimes shallow, fruit nearly

sessile often 2–3 together, seeds ovoid with a thickened corrugate margin often with large protuberances on the faces. *Roxb. Hort. Beng.* 104; *Fl. Ind.* iii. 728; *Blume Bijd.* 927; *Wall. Cat.* 6699; *Wight Ic. t.* 500; *W. & A. Prodr.* 345; *Miq. Fl. Ind. Bat.* i. pt. i. 660; *Dalz. & Gibs. Bomb. Fl.* 101; *Kurz in Journ. As. Soc.* 1877, pt. ii. 104. Bryonopsis courtallensis, *Arn. in Hook. Journ. Bot.* iii. 274. B. erythrocarpa, *Naud. in Ann. Sc. Nat.* ser. 4, xviii. 194. B. laciniosa, *Hook. f. in Oliv. Fl. Trop. Afr.* ii. 556. Cucumis verrucosus, *Herb. Rottler.*

From the HIMALAYA to CEYLON. PEGU; *Kurz.*—DISTRIB. Trop. Africa, Mauritius, Malaya, Australia.

Stems angular, slender, usually glabrous or nearly so. *Leaves* often scabrous, punctate above, lobes 2–3 in., with a broad or narrow sinus; petiole often longer than the blade, sometimes muricate near the apex. Male *pedicels* less than 1 in., usually glabrous, female still shorter. *Calyx-teeth* subulate. *Fruit* $\frac{3}{4}$ in. diam., green with white vertical stripes. *Seeds* $\frac{1}{4}$ in.

15. **MUKIA,** *Arn.*

Scabrous climbing herbs; tendrils simple. *Leaves* 3–7-angular, not deeply lobed, cordate, petioled and subsessile on the same plant. *Flowers* small, yellow, males and females clustered in the same axils; males very short-peduncled, females subsessile. MALE: calyx campanulate, teeth 5, subulate; corolla 5-partite; stamens 3, inserted low in the calyx-tube, anthers free, two 2-celled one 1-celled; cells straight, connective not produced. FEMALE: calyx and corolla as in the male; disk annular; ovary ovoid, hispid; style thick, apex 3–2-lobed; ovules not very many, horizontal; placentas 3–2. *Berry* globose, small, indehiscent. *Seeds* not very many, ovoid, compressed, strongly margined, faces rough or smooth.—DISTRIB. Species 2; one South Indian; the other African, Asiatic, and Australian.

1. **M. scabrella,** *Arn. in Hook. Journ. Bot.* iii. 276; very scabrous, leaves rough hispid beneath, seeds rough on their faces. *Naud. in Ann. Sc. Nat.* ser. 4, xii. 142; *Dalz. & Gibs. Bomb. Fl.* 100. M. maderaspatana, *Kurz in Journ. As. Soc.* 1877, pt. ii. 104. Bryonia scabrella, *Linn. f. Suppl.* 424; *DC. Prodr.* iii. 306; *Wall. Cat.* 6708; *W. & A. Prodr.* 305; *Wight Ic.* t. 501; *Roxb. Fl. Ind.* iii. 724; *Miq. Fl. Ind. Bat.* i. pt. i. 658. B. Wightiana, *Wall. Cat.* 6703. B. maderaspatana and althæoides, *DC. l. c.* 306. Cucumis maderaspatanus, *Linn. Sp. Pl.* 1438. Karivia javanica, *Miq. l. c.* 661. Trichosanthes dioica, *Wall Cat.* 6692 C.

Throughout INDIA, common: ascending the hills as far as subtropical warmth extends.—DISTRIB. Africa, Malaya, Australia.

Stem angular, slender, hispid or scabrid. *Leaves* 1–3 in., serrate; petiole often very short, sometimes 1 in. or more. *Flowers* $\frac{1}{8}$–$\frac{1}{6}$ in. diam. *Ovary* very hispid. *Fruit* $\frac{3}{8}$–$\frac{1}{2}$ in. diam., bright red.

VAR. *gracilis*; leaves $4\frac{1}{2}$ by $2\frac{1}{2}$ in. hastate elongate very acute wide at the base long-petioled nearly entire. Bryonia gracilis, *Wall. Cat.* 6714.—Pagamew (BURMA); *Wallich.* Possibly a distinct species.

2. **M. leiosperma,** *Thwaites Enum.* 125; scabrous, leaves hispid beneath and with much long soft hair, seeds smooth on their faces. Bryonia leiosperma, *W. & A. Prodr.* 345. B. mysorensis, *Miq. in Herb. Hohenack.*

DECCAN PENINSULA; Pulney Mts., *Wight.* Nilghiris, *G. Thomson, Hohenacker.* CEYLON; alt. 4000–5000 ft., *Thwaites.*

Nearly allied to *M. scabrella.* *Leaves* densely softly villose beneath when young and often when old, elongated acute at the apex.—Mr. Thwaites says the rudimentary pistil in the male flowers is more developed than in *M. scabrella* and is surrounded at the base with an annulus.

16. **ZEHNERIA,** *Endl.*

Climbing herbs; tendrils simple. *Leaves* long- or short-petioled, dentate, angular or deeply lobed, polymorphous. *Flowers* small, yellowish, monœcious or diœcious, males in a peduncled corymb, females solitary on short peduncles or sometimes subcorymbose on a longer peduncle; bracts 0 or very small. MALE: calyx tubular-campanulate, teeth 5 small; corolla divided nearly to the base into 5 triangular segments; stamens 3, inserted low in the calyx-tube, filaments glabrous or hairy (in the same species), anthers free, all 2-celled or (in the same species) one 1-celled; anther-cells curved or (in the same species) flexuose or sigmoid; connective often papillose at the top, scarcely produced FEMALE: calyx and corolla as in the male; ovary globose or oblong, glabrous or very hairy; style cylindric, 3-lobed, surrounded at the base by an annular disc; ovules many, horizontal; placentas 3. *Fruit* succulent, indehiscent, globose ellipsoid or cylindric. *Seeds* many or few, obovoid rounded or compressed, with or without a margin, faces smooth or somewhat tubercular or pitted.—DISTRIB. Species 15 (according to Bth. & Hk. f.) or 5 only; in tropical Asia, Australia, and Africa, with one species in South America.

1. **Z. Baueriana,** *Endl. Iconogr.* t. 116, 117; leaves cordate acute simple or 3–5-lobed half way down, petiole longer than the auricles, fruit $\frac{1}{2}$ by $\frac{3}{8}$ in. when dry reticulate-rugose ellipsoid, seeds much compressed oblong margined smooth or slightly tuberculate on the faces. Z. mucronata, *Miq. Fl. Ind. Bat.* i. pt. i. 656. Bryonia mucronata, *Blume. Bijd.* 923. B. mysorensis, *Wall. Cat.* 6702; *W. & A. Prodr.* 345; *Wight Ic.* t. 758; *Dalz. & Gibs. Bomb. Fl.* 101. ? B. filiformis, *Roxb. Fl. Ind.* iii. 727. Karivia samoensis, *A. Gray in Seem. Fl. Viti* 103.

DECCAN PENINSULA; *Wight*; *Heyne*; Nilghiris, *G. Thomson*; Canara, *Stocks*; Belgaum, *Ritchie.*—DISTRIB. Malaya, Japan, Norfolk Island, Feejees; but the area cannot be separated from that of the next species.

Weak, nearly glabrous. *Leaves* 2 in. diam., generally sharply denticulate; petiole $\frac{3}{4}$ in. or short. *Flowers* frequently monœcious in the same axils, sometimes apparently diœcious; male peduncle usually 1–2 in., female less than $\frac{1}{4}$ in., undivided in all the Indian examples, but occasionally the female peduncle is elongate umbellate according to Wight.—Roxburgh's *Bryonia filiformis* perhaps belongs here, but the ripe fruit is said to be near 1 in. It has been referred to *Melothria indica,* but the inflorescence is quite unlike that, as are the yellow flowers and stamens of Roxburgh's picture.

2. **Z. Hookeriana,** *Arn. in Hook. Journ. Bot.* iii. 275; leaves cordate acute simple or angular or 3–5-lobed half-way down, petiole longer than the auricles, fruit $\frac{3}{8}$ in. diam. when dry reticulate-rugose globose, seeds much flattened oblong margined smooth or slightly tuberculate on the faces. *Kurz in Journ. As. Soc.* 1877, pt. ii. 105. Z. exasperata, *Miq. Fl. Ind. Bat.* i. pt. i. 655. Z. scabra, *Harv. & Sond. Fl. Cap.* ii. 486; Bryonia Hookeriana, *W. & A. Prodr.* 345. B. cissoides, *Wall. Cat.* 6698. ? B. oxyphylla, *Wall. Cat.* 6697 (*no flowers*).

NORTH BENGAL; common in SIKKIM, ASSAM, KHASIA, and CACHAR, ascending to 5000 ft. alt. DECCAN PENINSULA and CEYLON, common; apparently always in the lower hills.—DISTRIB. Ava, Malaya, Africa.

Very near *Z. Baueriana* and possibly not distinct: but the ovary is globose even before the expansion of the flower. The leaves are also generally asperous above and sometimes much more hairy beneath than in any undoubted examples of *Z. Baueriana.* The African distribution of this cannot be defined, as *Z. scrobiculata* and even *Pilogyne lucida, Naud.* can hardly be distinguished from it.

3. **Z. umbellata,** *Thwaites Enum.* 125; leaves cordate or hastate rounded angled lobed or 3–5-partite nearly to the base, petiole usually shorter than the auricles, fruit $\frac{3}{4}$–$1\frac{1}{2}$ in. smooth or shortly silky cylindric not rugose, seeds few obovoid only slightly compressed margin obscure rounded faces quite smooth or slightly rough. *Kurz in Journ. As. Soc.* 1877, pt. ii. 105. Z. hastata *and* connivens, *Miq. Fl. Ind. Bat.* i. pt. i. 656. Karivia umbellata, *Arn. in Hook. Journ. Bot.* iii. 275; *Miq. l. c.* 661. K. Rheedii, *Roem.*; *Miq. l. c.* 661. Momordica umbellata, *Roxb. Fl. Ind.* iii. 710. Bryonia umbellata, *Klein*; *DC. Prodr.* iii. 305; *Wall. Cat.* 6705; *W. & A. Prodr.* 345; *Dalz. & Gibs. Bomb. Fl.* 101. B. sinuosa, *Wall. Cat.* 6716, *partly*. B. amplexicaulis, *Lamk. Dict.* i. 496; *DC. l. c.* 306; *W. & A. Prodr.* 346. B. sagittata and Rheedei, *Blume*; *DC. l. c.* 305, 306. Harlandia bryonioides, *Hance in Walp. Ann.* ii. 648.—*Rheede Hort. Mal.* viii. t. 26.

Throughout India and Ceylon, very common.—Distrib. Malaya, China, North Australia.

Stem and *leaves* usually nearly glabrous, or leaves scabrous above; petiole short, often hispid. *Leaves* polymorphous; sometimes 6 by scarcely 1 in., narrow triangular-lanceolate, sometimes cordate-oblong much rounded, often palmate nearly to the base with 3–5 narrow divaricate segments; basal lobes usually produced strongly backwards, rounded subacute or most acute. *Inflorescence* usually diœcious, male corymbose on a peduncle 2–4 in. or sessile; *pedicels* glabrous or hairy, subbracteate; females solitary, very short peduncled. Young *ovary* narrow-oblong, glabrous or somewhat pubescent. *Fruit* bright-red, usually much larger than that of the two preceding species. *Seeds* about 12; sometimes only 4–6 in the typical *Z. umbellata*, as said always in *Z. amplexicaulis* by W. & A.—Wight says that *Z. umbellata* may be distinguished from *Z. amplexicaulis* by having small oblong bracts on the middle of the pedicels, but these cannot be made out even in Wight's own specimens.

Var. *nepalensis*, leaves deeply 5-palmate with narrow lobes, scattered glands, young ovary densely velvety, seeds oblong slightly compressed quite smooth and rounded with no trace of a margin. *Bryonia nepalensis*, Seringe in DC. Prodr. iii. 307.—Temperate Western Himalaya, alt. 4000–7000 ft.; *Royle*; *Thomson*; *Jacquemont*; *Strachey & Winterbottom*, &c.—A variety many times collected but only within a very limited area in Gurwhal, Kumaon and Kunawur.

17. **MELOTHRIA,** *Linn.*

Climbing herbs; tendrils simple or 2-fid. *Leaves* petioled, deltoid, truncate or hastate, entire or deeply 3-lobed, little hairy, often punctate. *Flowers* small, white, usually monœcious, males and females often from the same axil; male pedicels long, clustered (rarely subsolitary) in the axils, or clustered on long racemes resembling branches without leaves; female long-pedicelled. Male: calyx-tube short, teeth 5, small; corolla 5-partite; stamens 3, inserted in the middle of the calyx-tube; anthers free, one 1-celled, two 2-celled; cells free, straight, simple, more or less lateral, connective prolonged, undivided, glabrous. Female: calyx and corolla as in the male; ovary oblong, style long, stigmas 3 subglobose; ovules many, horizontal; placentas 3, vertical. *Fruit* indehiscent, globose, acute, or fusiform subrostrate. *Seeds* many, small, oblong, much compressed, obscurely margined, smooth or very nearly so.—Distrib. Species 25, all tropical.

* *Fruit fusiform, subtrigonous.*

1. **M. zeylanica,** *C. B. Clarke*; tendrils simple, leaves not lobed little cordate, male pedicels clustered in the axils, fruit $1\frac{3}{4}$ in. fusiform. M. deltoidea, *Thwaites Enum.* 124. Æchmandra deltoidea, *Arn. in Hook. Journ. Bot.* iii. 274. Bryonia deltoidea, *Arn. Pugill.* 19.

CEYLON; common up to 5000 ft., *Walker*; *Gardner*.

Nearly glabrous, stems thin. *Leaves* 2 by $1\frac{1}{2}$ in., acute, often punctate on both surfaces; petiole 1 in. *Pedicels* of males and females about as long as the petioles. *Corolla* hairy round the throat; rudimentary ovary of the male depressed-globose. *Ovary* fusiform; stigma large, 3-lobed. *Fruit* $\frac{1}{2}$ in. broad, obtusely trigonous, almost rostrate. *Seeds* $\frac{1}{8}$ in., packed in three columns.—The name *M. deltoidea* is preoccupied by *Benth. in Flora Nigrit.* 368 for a different plant.

2. **M. Wallichii,** *C. B. Clarke*; tendrils simple, leaves not lobed little cordate, male peduncle racemed, fruit 2 in. fusiform. Bryonia odorata, *Wall. Cat.* 6706 D.

PROME (Burmah); *Wallich.*

Stem glabrous. *Leaves* 2–3 by $2\frac{1}{2}$–$3\frac{1}{2}$ in., very broadly deltoid, sharply triangular, sinuous scarcely denticulate, scabrous above with flat round glands, slightly hispid beneath. Male *raceme* nearly as in *M. odorata*. Fruit *pedicel* $\frac{3}{4}$ in. *Fruit* rostrate, attenuate at the base, resembling closely that of *M. zeylanica* but rather larger. *Seeds* nearly $\frac{1}{4}$ in., larger than those of *M. zeylanica*, many, oblong, very complanate, hardly margined, smooth on the faces.

** *Fruit globose, subquadrate, obtuse.*

3. **M. indica,** *Lour. Fl. Cochinch.* 43; tendrils simple, leaves more or less cordate entire or somewhat 3-lobed, male pedicels clustered in the axils, fruit $\frac{1}{3}$ in. ellipsoid pointed. *DC. Prodr.* iii. 313; *Naud. in Ann. Sc. Nat.* ser. 4, xvi. 169, *with a fig.*; *Kurz in Journ. As. Soc.* 1877, pt. ii. 105. M. Regelii, *Naud. l. c.* ser. 5, v. 35. Æchmandra indica, *Arn. in Hook. Journ. Bot.* iii. 274; *Miq. Fl. Ind. Bat.* i. pt. i. 658. Bryonia tenella, *Roxb. Fl. Ind.* iii. 725.

SIKKIM, alt. 3000 ft.; *C. B. Clarke.* SILHET in the Jheels; *H. f. & T.* CHITTAGONG; *Kurz.*—DISTRIB. Malaya to the Philippines, China, Japan.

Nearly glabrous, stem slender. *Leaves* $1\frac{1}{2}$ by $1\frac{1}{2}$ in., acuminate or scarcely acute, often punctate on both surfaces; petiole 1 in. *Pedicels* of males and females about as long as the petioles. Point of the *connective* short. *Fruit* white, seeds strongly margined (*ex Naudin*).—This appears exceedingly rare in India: but it may be doubted whether the next is other than a form of it: see *Benth. Fl. Hongk.* 125.

4. **M. odorata,** *Hk. f. & T. in Herb.*; tendrils simple, leaves more or less cordate entire or somewhat 3-lobed, male pedicels in distant clusters on long racemes, fruit $\frac{3}{8}$–$\frac{1}{2}$ in. globose quadrate very obtuse. Bryonia odorata, *Ham. in Wall. Cat.* 6706 A. B. C.

NORTH-WEST HIMALAYA; *Royle.* Throughout the plain of EAST BENGAL, common, and ascending the hills to 7000 ft. alt.

Nearly glabrous, stem often stouter than in *M. indica*. *Leaves* 2–3 by $1\frac{1}{2}$–$2\frac{1}{2}$ in., acute, often punctate on both surfaces; petiole 1–$1\frac{1}{2}$ in. Male *peduncle* long, somewhat zigzag, with a cluster of pedicels (each $\frac{1}{2}$–$\frac{3}{4}$ in.) at each angle; female pedicel as long as the petiole. *Corolla* white, with much hair round the throat. *Connective* not much produced; rudiment of ovary in the male flower globose depressed. *Seeds* $\frac{1}{8}$–$\frac{1}{6}$ in., not or very obscurely margined.—This species has been separated from *M. indica* by the long raceme of the male flowers, which, however, does not essentially differ. The fruit appears very obtuse, the degree of margination of the seeds can hardly be relied on.

VAR. *triloba*; lobes of leaf divaricating sometimes very narrow and long, petiole often shorter than in the type. Bryonia triflora, *Wall. Cat.* 6707.—East Bengal;

Soorma Bank, *Griffith* (Kew Distrib. No. 2530).—The male inflorescence and the fruit are altogether those of *M. odorata*; the leaves unlike.

5. **M. bicirrhosa,** *C. B. Clarke*; tendrils 2-fid, leaves deeply cordate ovate caudate-acuminate, male inflorescence elongate racemed.

BIRMA; *Griffith* (Kew Distrib. No. 2522).

Nearly glabrous; stem like that of *M. odorata*; tendrils stout all 2-fid. *Leaves* 4 by 3 in.; petiole 2–3 in. *Inflorescence* exactly as in *M. odorata*. Male *flower* altogether of the genus, anthers lateral on the connective which is long produced above them: rudiment of the ovary depressed globose. *Fruit* not seen.—This appears as an excessively developed *M. odorata*.

18. RHYNCHOCARPA, *Schrader*.

Climbing herbs; tendrils simple. *Leaves* petioled, orbicular and undivided in the Indian species. *Flowers* monœcious or diœcious, very small; males subcorymbose on a short peduncle; females solitary (rarely aggregated), subsessile, sometimes in the same axil with the male. MALE: calyx-tube campanulate, teeth 5, small; corolla 5-partite; stamens 3 (rarely 5); anthers free or united one 1-celled, the others 2-celled; cells straight; connective crested 2-lobed or long-produced in two points. FEMALE: calyx and corolla as in the male; ovary ovoid, beaked; style ending in 2 rarely in 3 long stigmas; ovules not many, horizontal; placentas 2 rarely 3, vertical. *Fruit* ovoid, rostrate, indehiscent. *Seeds* ovoid, compressed, not very many.—DISTRIB. Species 5; in warmer Africa, one also in Western India.

1. **R. fœtida,** *Schrad. in Linnæa*, xii. 404; fœtid, scaberulous-pubescent, stigmas 2, fruit $\frac{1}{3}$ in. globose pubescent beak nearly $\frac{1}{3}$ in., seeds 4–6. *Naud. in Ann. Sc. Nat. ser.* 4, xii. 146. R. rostrata, *Kurz in Journ. As. Soc.* 1877, pt. ii. 105. Æchmandra rostrata, *Arn. in Hook. Journ. Bot.* iii. 274; *Dalz. & Gibs. Bomb. Fl.* 100. Bryonia pilosa, *Roxb. Hort. Beng.* 104, *Fl. Ind.* iii. 726. B. filicaulis, *Wall. Cat.* 6713. B. rostrata, *Rottler*; *DC. Prodr.* iii. 304; *Wall. Cat.* 6701; *W. & A. Prodr.* 346. B. Perottetiana, *Seringe in DC. l. c.* Trichosanthes fœtidissima, *Jacq. Ic. Rar.* t. 624, Melothria fœtida, *Lamk. Dict.* iv. 87. Cyrtonema convolvulacea and divergens, *Rich. Fl. Abyss.* i. 286.

GUZERAT; *Dalzell*. DECCAN PENINSULA; *Rottler*; *Wight*. Malabar Hills? *Stocks*; *Dr. Ritchie*. AVA, *Wallich*.—DISTRIB. Tropical Africa and Natal.

Stem somewhat stout, pubescent. *Leaves* 2 in. diam., orbicular or ovate, cordate, dentate; petiole $\frac{1}{2}$–1 in. Male *racemes* small, scarcely 1 in. *Calyx* hairy with subulate teeth. Connective of each *anther* produced into a long curved pointed horn. *Fruit* bright red, 2-celled. *Seeds* $\frac{1}{6}$ in., distinctly margined.

SPECIES IMPERFECTLY KNOWN.

R.? DELTOIDEA, *Kurz in Journ. As. Soc.* 1877, pt. ii. 105; leaves deltoid with spreading acute basal lobes rough above, berries smooth glabrous.

Upper TENASSERIM, Attaran, *Brandis*; PEGU and PROME, *Kurz*.

Not seen; from the description it may be a variety of *R. fœtida*.

19. CORALLOCARPUS, *Welw.*

Climbing or prostrate herbs, scabrid or subtomentose; tendrils simple. *Leaves* petioled, roundish-cordate, somewhat thick, entire lobed or palmate. *Flowers*

very small, monœcious; males in a small corymb at the apex of a long peduncle; females short-pedicelled or subsessile, solitary or clustered. MALE: calyx-tube campanulate, lobes 5, short; corolla 5-partite; stamens 3, nearly sessile at the mouth of the calyx-tube, anthers free, all 2-celled or one 1-celled; cells straight, oblong, lateral on the thin connective which is not produced; ovary rudimentary. FEMALE: calyx and corolla as in the male; ovary ovoid; disc 0; stigmas 3 or 2; ovules not very many, horizontal; placentas 3–2, vertical. *Berry* ovoid, circumsciss near the base, usually rostrate. *Seeds* not very many, ellipsoid or nearly globose, somewhat compressed, smooth or nearly so, little margined.—DISTRIB. Species 6, in Tropical Africa, the Persian Gulf, and Western India.

1. **C. epigæa,** *Hook. f. in Gen. Pl.* i. 831; leaves punctate or scabrid with minute hairs, fruit ellipsoid or ovoid suddenly contracted into the beak distinctly pedicelled, seeds ellipsoid slightly margined. Æchmandra epigæa, *Arn. in Hook. Journ. Bot.* iii. 274; *Wight Ic. t.* 503; *Dalz. & Gibs. Bomb. Fl.* 100. Bryonia epigæa, *Rottler*; *Willd. Sp. Pl.* iv. 619; *Wall. Cat.* 6709; *W. & A. Prodr.* 346. B. glabra, *Roxb. Hort Beng.* 104, *Fl. Ind.* iii. 725. B. sinuata, *Wall. Cat.* 6711 D.

PUNJAB, Rawul Pindee; *J. E. T. Aitcheson.* SCINDE and GUJERAT; *Dalzell.* DECCAN PENINSULA; *Rottler*; *Wight.* Belgaum; *Ritchie.* CEYLON; *Thwaites.*

Leaves 2 in. diam., nearly entire 3–5-angular or 3–5-lobed; lobes usually broad sometimes narrow, commonly roundish or sinuous on the margin; petiole 1 in. Male *peduncle* 1½–2 in., female ¼–½ in. or sometimes 1 in. *Fruit* ⅝ in., beak ¼ in. more. *Seeds* about six, much longer than broad.

2. **C. conocarpa,** *Hook. f. in Gen. Pl.* i. 831; leaves with minute white hairs on both surfaces hardly scabrid, fruit sessile conical not suddenly contracted into the beak, seeds ellipsoid not margined. Æchmandra conocarpa, *Dalz. & Gibs. Bomb. Fl.* 100? C. Fenzlii, *Hook. f. in Oliv. Fl. Trop. Afr.* ii. 565.

GUJERAT, near Malpor and Gundar; *Dalzell.* Also in *Stocks'* collection probably from Scinde.—DISTRIB. Central Africa.

Hardly differs from *C. epigæa* but in the points specified in the diagnosis. The leaves are 5-lobed, the lobes lanceolate, acute, narrow at each end.

3. **C. velutina,** *Hook. f. in Gen. Pl.* i. 831; leaves shortly villous on both surfaces, peduncles pedicels and calyx villous, fruit ellipsoid sessile suddenly narrowed into a short beak, seeds globose compressed hardly margined. Æchmandra velutina, *Dalz. & Gibs. Bomb. Fl.* 100. ? C. etbaicus, *Hook. f. in Oliv. Fl. Trop. Afr.* ii. 567.

SCINDE; *Dalzell.*—DISTRIB. Persian Gulf and Tropical Africa?

Whole plant villous. *Leaves* 2 in. diam., subentire or more or less 3–5-lobed, lobes rounded; petiole ¾ in. Male *peduncle* 3 in. with 12 flowers at the top. Male and female *flowers* as in *C. epigæa.* *Fruit* ½ in. the beak ⅛ in. *Seeds* about 12, ⅛ in. diam.

20. CERASIOCARPUM, *Hook. f.*

Climbing glabrous herbs; tendrils simple. *Leaves* long-petioled, oblong, cordate, nearly entire. *Flowers* very small, monœcious; male peduncle carrying a few clustered flowers at the top; female flower sessile, solitary, often in the same axil with the male. MALE: calyx-tube short campanulate with 5 minute teeth; corolla 5-partite; stamens 3; anthers subsessile, distinct, one 1-celled, two 2-celled; cells oblong, lateral on the connective which is not produced;

rudiment of the ovary 0. FEMALE: calyx and corolla as in the male; ovary ovoid; disc 0, stigmas 3; ovules few, horizontal; placentas vertical. *Fruit* ellipsoid, subsessile, indehiscent, without a beak. *Seeds* 2–6, ovoid, smooth, slightly compressed.

1. **C. zeylanicum,** *Hook. f. in Gen. Pl.* i. 832, female flower subsessile, seeds ovoid smooth slightly compressed. Æchmandra zeylanica, *Thwaites Enum.* 125.

CEYLON; alt. 3000–5000 ft.; *Thwaites.*

Leaves 3–6 in., obtuse or acute, cordate or hastate, almost 3-lobed, entire or undulate-denticulate; petiole $\frac{1}{2}$–1$\frac{1}{2}$ in. *Flowers* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., yellow; petals broad, acuminate. *Berry* at most $\frac{1}{2}$ in. diam. *Seeds* $\frac{1}{6}$–$\frac{1}{4}$ in. diam., little compressed, incompletely margined, 2–6 to each fruit.

DOUBTFUL SPECIES.

2. C.? PENANGENSE, *C. B. Clarke*; female peduncle $\frac{2}{3}$–1$\frac{1}{4}$ in., seeds much compressed somewhat rugose on the faces. Bryonia heterophylla, *Wall. Cat.* 6704.

PINANG; *Wallich.*

Stems rather strong, minutely pilose; tendrils simple. *Leaves* cordate-oblong, acute, entire slightly denticulate, scabrous above minutely hispid beneath. *Flowers* monœcious, all peduncled, solitary female and racemed males from the same axil; male peduncle 1$\frac{1}{2}$ in. with 8 small pedicels at the summit. *Fruit* $\frac{3}{8}$–$\frac{1}{2}$ in. diam., smooth, nearly globose. *Seeds* 4 to 6, $\frac{1}{6}$ in., somewhat margined, oblong.—Closely resembles *C. zeylanicum* except as to the peduncled female: but there are no flowers on Wallich's example.

3.? C. MAINGAYI, *C. B. Clarke*; leaves 3-lobed and entire, female peduncle $\frac{1}{2}$–$\frac{3}{4}$ in., seeds margined not much compressed very rugose pitted on the faces.

MALACCA; *Maingay* No. 1268.

Stems nearly glabrous; tendrils simple. *Leaves* 2 by 1$\frac{1}{2}$ in., with three divaricate lanceolate lobes or entire, not much cordate, scabrous on both surfaces; petiole $\frac{1}{2}$ in. Male *peduncle* 1$\frac{1}{2}$ in. with 8 minute pedicels at the summit; female from the same axil. *Stamens* of the genus. *Fruit* $\frac{5}{8}$ by less than $\frac{3}{8}$ in., oblong, subacute. *Seeds* 10–12, less than $\frac{1}{8}$ in.—This may be a *Melothria,* but the long male peduncle with short pedicels and the unproduced connective do not suit. The capsule and seeds do not suit *Cerasiocarpum.*

21. CTENOLEPIS, *Hook. f.*

Climbing or prostrate scabrous herbs, turning black in drying; tendrils simple. *Leaves* cordate, orbicular, 5–7-lobed; stipuliform bracts at the axils of the leaves large round or elliptic, ciliate or dentate. *Flowers* minute, monœcious; males in small racemes on inconspicuous axile peduncles; female solitary, short-peduncled, in the same axil with the male. MALE: calyx-tube short, campanulate, lobes 5, subulate; corolla 5-partite; stamens 3, filaments very short; anthers free, one 1-celled, two 2-celled; cells straight, connective not produced; rudiment of ovary 0. FEMALE: calyx and corolla as in the male; ovary ovoid; 1-celled; disc 0; style columnar, stigmas 2 or 3; ovules 2 or 3, horizontal; placentas parietal. *Fruit* small, globose or subquadrate, oblique, indehiscent. *Seeds* 2 or 3, ellipsoid, much compressed, acutely margined, somewhat boat-shaped.—DISTRIB. Species 3; in India, Tropical Western Asia and Tropical Africa. The remarkable stipuliform bracts are characteristic of this genus.

1. **C. Garcini,** *Naud. in Ann. Sc. Nat.* ser. 5, vi. 13; middle lobe of the

leaf not very acute nor much longer than the others, male peduncle less than ¼ in., fruit not longer than broad. Bryonia Garcini, *DC. Prodr.* iii. 308; *Roxb. Fl. Ind.* iii. 727; *Wall. Cat.* 6712; *W. & A. Prodr.* 344. Zehneria Garcini, *Stocks in Hook. Kew Journ. Bot.* iv. 149; *Dalz. & Gibs. Bomb. Fl.* 99.

BUNDELKUND; *Edgeworth.* DECCAN PENINSULA; *Rottler*, &c. CEYLON; *Thwaites.*
Annual; stem not elongate, more or less scabrous and punctate, scarcely at all hairy. *Leaves* 1–1½ in. diam., lobes often sinuate and lobed; petiole ½–¾ in.; stipuliform bracts ¼ in. and more, elliptic, with long cilia. *Fruit* ⅕ by ¼ in.

2. **C. cerasiformis,** *Naud. in Ann. Sc. Nat.* ser. 5, vi. 13; middle lobe of the leaf acute longer than the others, male peduncle ½–1 in., fruit ellipsoid not in the least narrowed into the peduncle. Zehneria cerasiformis, *Stocks in Hook. Kew Journ. Bot.* iv. 149.

SCINDE; *Stocks.* GUJERAT; *Dalzell.*—DISTRIB. Tropical and Southern Africa.
Hardly distinguishable from *C. Garcini. Leaves* usually larger, sometimes 3 in. diam.

22. DICÆLOSPERMUM, *C. B. Clarke.*

A climbing scabrous herb; tendrils simple. *Leaves* petioled, cordate or hastate, ovate, acute, little lobed. *Flowers* minute; males and females clustered in the same axils, short-pedicelled. MALE: calyx-tube short, campanulate, teeth 5, minute; corolla 5-partite; stamens 3, filaments very short, anthers free, one 1-celled, two 2-celled; cells oblong, straight; connective not produced. *Fruit* small, membranous, obovoid, subtrigonous, 1-celled, with 3 basal erect seeds. *Seeds* with three parallel equal cells, the two lateral empty.

1. **D. Ritchiei,** *C. B. Clarke.*

BELGAUM; *Ritchie.* Also in Herb. Stocks doubtless from Western India.
Exceedingly like *Mukia scabrella* except as to the seeds, and the flowers are smaller. *Leaves* 2½ by 1¾ in., scabrid and somewhat hispid on both surfaces; petiole ¾ in. *Fruit* ¼ in. diam. *Seeds* ⅙ by ⅕ and $\frac{1}{10}$ in. thick, attached to the very bottom of the fruit, erect.—Female *flowers* not seen.

23. THLADIANTHA, *Bunge.*

Climbing herbs; tendrils simple, rarely 2-fid. *Leaves* petioled, entire or tripartite, deeply cordate, denticulate, softly pubescent or nearly glabrous. *Flowers* diœcious, yellow, large or small. Male *peduncles* in the fully developed plant paired, one 1-flowered ebracteate caducous, the other racemed the flowers with or without bracts; female peduncle elongate, 1-flowered, ebracteate. MALE: calyx-tube shortly campanulate, the bottom shut by a horizontal scale; segments 5, lanceolate; corolla campanulate, 5-partite, segments revolute about half-way down; filaments 5, inserted near the mouth of the calyx-tube; anther 1-celled, narrow-oblong, straight. FEMALE: calyx and corolla as in the male; ovary oblong, style deeply 3-fid with 3 reniform stigmas; ovules many, horizontal; placentas 3, vertical. *Fruit* ellipsoid, obtuse, indehiscent, green, cylindric with vertical ribs. *Seeds* many, horizontal, small, obovoid, compressed, smooth.—DISTRIB. Species 2, Bengal, Malaya, China.

The generic character is here widened to include the Khasia species. As in most Cucurbits with paired male peduncles, either the simple or the racemed one is often wanting, and the two do not flower together; the simple peduncle generally falls off

by the time the racemed one is in blossom. The corolla is slightly oblique; in *T. dubia* besides the normal large male flowers much smaller imperfect ones are often found.

1. **T. dubia,** *Bunge Enum. Pl. Chin. Bor.* 29; leaves deeply cordate ovate acute undivided, male racemes with prominent bracts, petals ¾ in. golden yellow. *Naud. in Ann. Sc. Nat.* ser. 4, xii. 150, *t.* 10; *Bot. Mag. t.* 5469; *Kurz in Journ. As. Soc.* 1877, pt. ii. 102. Momordica calcarata, *Wall. Cat.* 6740. Gymnopetalum Horsfieldii and piperifolium, *Miq. Fl. Ind. Bat.* i. pt. i. 680.

Plain of EAST BENGAL common, ascending to 8000 ft. in the hills. The female plant is rare and has never been collected in the plains. PEGU; *Kurz.*—DISTRIB. Malaya, China.

A large climber. *Leaves* 4 by 2½ in., denticulate, not at all angular, usually villous beneath sometimes nearly glabrous; petiole 1½ in. *Tendrils* simple in all the wild examples, but in Naudin's strong cultivated plants bifid. Male *racemes* 2–3 in., flowers approximated, bracts serrate or incise-serrate; calyx-teeth very narrow; filaments minutely hairy. Female *peduncle* 2–3 in., more or less hairy; young ovary densely woolly. *Fruit* 1½ by ¾ in., glabrous, obtuse at both ends. *Seeds* scarcely ¼ in.—There is an admirable picture of this plant amongst Roxburgh's drawings.

2. **T. Hookeri,** *C. B. Clarke*; leaves deeply cordate-ovate acute entire and tripartite with lanceolate segments, male racemes without bracts, petals less than ½ in.

ASSAM; *Griffith* (Kew Distrib. No. 769, 2553). KHASIA MTS., alt. 4000–6000 ft.; Myrung and Nunklow; *H. f. & T.*

A large climber; tendrils simple. *Leaves* polymorphous, acute, resembling altogether those of *T. dubia*, but generally less hairy and thinner, or tripartite, with segments 4 by 1¾ in., the two lateral lobes very cordate and auricled on the outer base; petiolules hardly ⅛ in.; petiole 2 in. The female *flower* in Griffith's example resembles that of *T. dubia* but is smaller though the petals are slightly more than ½ in; peduncle about 1 in. Male *racemes* 1¼ in., slender; flowers pedicelled, scattered, yellow; petals scarcely ¼ in.; these small flowers probably correspond to the small imperfect males often found in *T. dubia*; if so the large perfect males of *T. Hookeri* are as yet unknown. *Fruit* (and seeds) altogether like those of *T. dubia*, but rather smaller, 1½ in. —The ebracteate male raceme of this with pedicels ½ in. is exceedingly unlike that of *T. dubia*: but in all other points they appear congeneric, and the habit is the same.

24. **EDGARIA,** *C. B. Clarke.*

A large scandent herb; tendrils 2-fid. *Leaves* petioled, entire, ovate, acute, deeply cordate, more or less pubescent. *Flowers* large, diœcious, yellow. Male *peduncles* paired, one 1-flowered caducous, the other racemed; bracts 0 or inconspicuous; female peduncle elongate, 1-flowered. MALE: calyx-tube elongate, funnel-shaped, teeth 5, subulate; corolla deeply 5-partite, with obovate acute segments; stamens 3, included in the calyx-tube; filaments exceedingly short; anthers connate into a cylindric tube, one 1-celled, two 2-celled; cells straight, linear-oblong, connective not appendaged. FEMALE: calyx and corolla as in the male; ovary narrow-obovoid, 3-celled; style long, stigmas 3, oblong, 2-fid; ovules 1–3 superimposed in each cell, horizontal or subpendulous. *Capsule* large, broadly fusiform, trigonous, 3-celled, fibrous, dry, 3 valved, valves dehiscing downwards and leaving the trigonous central axis. *Seeds* 1–3 in each cell, pendulous, compressed, subquadrate, large, corrugate or somewhat 3-lobed at the lower end and faces when dry.

1. **E. darjeelingensis,** *C. B. Clarke in Journ. Linn. Soc.* xv. 114. Gymnopetalum sp. 5, *Herb. Ind. Or., H. f. & T.*

GURWHAL; *Falconer.* SIKKIM, alt., 5000–8000 ft., very common; *J. D. H.*; *C. B. Clarke.*

Leaves 4 by 3½ in., serrate and denticulate; petiole 3 in. Male *raceme* 6 in., female 3–4 in. *Calyx-tube* ¾ in. *Petals* ⅜ in., widely patent. *Fruit* 3 by 1¼ in., somewhat pilose, with 2 wavy vertical ribs on each face. *Seed* ½ by ⅓ and $\frac{1}{10}$ in. thick.

25. GOMPHOGYNE, *Griff.*

Climbing, weak, succulent herbs, tendrils 2-fid or simple. *Leaves* petioled, pedate, with 5–7 lanceolate serrate leaflets. *Flowers* small, monœcious (sometimes at least), males racemed; females panicled or clustered. MALE: calyx rotate, 5-partite, with oblong segments; corolla 5-partite, with elongate erose segments; stamens 5, filaments united at the base; anthers globose, 1-celled, straight. FEMALE: calyx produced above the ovary and corolla as in the male; corolla-segments caudate; ovary top-shaped, 1-celled; styles 3, 2-fid at the apex; ovules 3, pendulous. *Capsule* top-shaped, 3-valved at the wide truncate summit, crowned by the persistent styles. *Seeds* 3 (2–1), ellipsoid, little compressed, black, obscurely margined.—DISTRIB. Species 2, one in the Himalaya one in Burma.

1. **G. cissiformis,** *Griff. Pl. Cantor.* p. 26; capsule somewhat succulent ¼ in. wide at the summit, seeds ¼ in. oblong with scaly tubercles on the rounded faces.

GURWHAL, alt. 7500 ft.; *Madden.* KUMAON; alt. 7000 ft.; *Edgeworth, Strachey & Winterbottom.* SIKKIM, alt. 5000–7000 ft.; Lachoong, *J. D. H.*; Doobdi, *C. B. Clarke.*

Leaves 2½ in. diam., glabrous or slightly pubescent; petiole 1–1½ in. Male *racemes* 1–6 in., often compound (or appearing so), towards the end of leafless branchlets. *Females* clustered near the axils or on panicles 2–4 in. *Capsule* ⅜ in.

2. **G. heterosperma,** *Kurz in Journ. As. Soc.*, 1878, pt. ii. 105; capsule dry 9-ribbed ⅕ in. wide at the summit, seed ⅛ in. ovoid rugose-lacunose. Zanonia? heterosperma, *Wall. Cat.* 3728.

BURMA; at Taong-dong; *Wallich.*

The leaves and inflorescence closely resemble *G. cissiformis.* The capsule is ¼ in., but narrow linear-oblong.

26. ACTINOSTEMMA, *Griff.*

A climbing weak herb; tendrils simple and 2-fid. *Leaves* petioled, deeply cordate or hastate, elongate, much toothed, nearly glabrous. *Flowers* small, monœcious, in lax axillary panicles, pedicels jointed about their middle; panicles frequently male with a few females near the base. MALE: calyx rotate, 5-partite, with lanceolate-linear segments; corolla 5-partite, segments lanceolate-caudate; stamens 5, free; connective dilated-papillose on one side with a narrow straight oblong anther-cell on the other. FEMALE: calyx and corolla as in the male; ovary subglobose, verrucose, 1-celled; style short, with 2 reniform stigmas; ovules 2–4, pendulous, subparietal. *Capsule* ovoid-conical, half-superior, covered with rough points, circumsciss above the middle. *Seeds* 2–4, compressed, ovate, corrugated and denticulate on the margin.

1. **A. tenerum,** *Griff. Pl. Cantor.* 25; *Naud. in Ann. Sc. Nat.* ser. 5, v. 39. Mitrosicyos lobatus, *Maxim. in Prim. Fl. Amur.* 112, t. vii. Pomasterion japonicum, *Miq. Ann. Mus. Lugd. Bat.* ii. 80. Sicyos oxyacanthus, *Wall. Cat.* 6683. Momordica Paina, *Wall. Cat.* 6742. Cucurbitaceæ, *Wall. Cat.* 9060.

Plain of EAST BENGAL, frequent. ASSAM. SILHET.—DISTRIB. Amurland, Japan.

Leaves 4 by 2½ in., acute, scarcely lobed in the Bengal specimens, palmately lobed in Maximowicz'; petiole often 2 in. *Panicles* 3–6 in. *Fruit* ¾ by ½ in., not at all trigonous, upper part muricated as well as the lower. *Seeds* ½ by ⅜ in.

27. GYNOSTEMMA, *Blume.*

A climbing herb; tendrils simple. *Leaves* pedate; leaflets 3–5, ovate-lanceolate, serrate, membranous. *Flowers* small, diœcious, in axillary diffuse panicles, greenish. MALE: calyx short, with 5 small lobes; corolla rotate, 5-partite, with lanceolate segments; stamens 5, filaments connate below; anthers 2-celled; cells long, straight. FEMALE: calyx and corolla as in the male; ovary spherical, 3–2-celled; styles 3–2, united at the base, at the apex 2-fid; ovules in each cell 2, pendulous. *Fruit* globose, size of a pea, umbonate, indehiscent, 1–3-seeded. *Seed* not winged, verrucose, submuricate.

1. **G. pedata,** *Blume Bijd.* 23; leaflets glabrous beneath or slightly pubescent, panicles more or less pubescent. *Miq. Fl. Ind. Bat.* i. pt. ii. 687. G. cissoides, pedata and Wightiana, *Bth. & Hk. f. Gen. Pl.* i. 839. Enkylia digyna and trigyna, *Griff. Pl. Cantor.* 27. Zanonia Wightiana, *Arn. in Hook. Journ. Bot.* ii. 272. Z. cissoidea and laxa, *Wall. Pl. As. Rar.* ii. 28, 29; *Wall. Cat.* 3726, 3727. Z. pedata, *Miq. Fl. Ind. Bat.* i. pt. i. 683. Pestalozzia pedata, *Zoll. et Mor. Syst. Verz.* 31. P. laxa, *Thwaites Enum.* 124.

KUMAON; *Strachey & Winterbottom.* NIPAL; *Wallich.* SIKKIM, ASSAM, KHASIA, common up to 5000 ft. alt. CEYLON; *Thwaites.*—DISTRIB. Malaya, Japan.

Glabrous or pubescent. *Leaflets* 5 or 3 by 1½–2 in., lanceolate or obovate-lanceolate; petiolules $\frac{1}{20}$–⅛ in.; petiole 1–1½ in., often pubescent with a line of crisped hairs. *Panicles* usually 3–6 in., sometimes 15 in. by nearly a foot broad, leafless. *Styles* 3 and 2 on the same plant. *Fruit* ⅙ in. diam., glabrous or puberulous. *Seed* ⅛ in., ellipsoid, subtrapezoid.

28. ZANONIA, *Linn.*

Climbing herbs; tendrils simple. *Leaves* long-petioled, simple, ovate or oblong. *Flowers* diœcious, in large compound pendulous racemes, males pedicelled, females subsessile. MALE: sepals 3, oblong or orbicular, concave; corolla rotate, 5-partite, segments subacute; stamens 5, free, inserted on a fleshy disc, filaments very short; anthers 1-celled, transversely oblong. FEMALE: calyx and corolla as in the male; ovary subclavate, at first 3-celled, styles 3, spreading, 2-fid at the apex; ovules in each cell 2 or many, pendulous, attached in 2 series to a fleshy parietal placenta. *Capsule* large, elongate-cylindric, clavate, 3-valved at the truncate apex. *Seeds* large, oblong, pendulous, compressed, surrounded by a large membranous wing.—DISTRIB. Species 2–3, extending from India to Borneo.

1. **Z. indica,** *Linn.*; *DC. Prodr.* iii. 298; leaves ovate rounded or cordate at the base glabrous or nearly so, fruit 4 in., seeds few pendulous from the summit of the fruit (*Dalzell*) wing 2–3 in. *Lamk. Ill.* t. 816; *Blume Bijd.* 937;

W. & A. Prodr. 340; *Wight Ill.* t. 103; *Dalz. & Gibs. Bomb. Fl.* 99; *Miq. Fl. Ind. Bat.* i. pt. i. 682.—*Rheede Hort. Mal.* viii. t. 47, 48, 49.

ASSAM and EAST BENGAL; *Griffith.* DECCAN PENINSULA; *Wight.* MALABAR MTS.; *Stocks, Law, Dalzell.* CEYLON; not uncommon up to 2000 ft., *Thwaites.*—DISTRIB. Malaya.

Leaves 6–8 by 3–4 in., usually acute; petiole 1 in. Male *flowers* very small, pedicels $\frac{1}{8}$–$\frac{1}{4}$ in.; female flowers including the ovary $\frac{1}{2}$ in. *Ovary* early becoming 1-celled by the separation of the 3 fleshy placentas which only at first meet in its centre. *Seeds* much compressed, hardly $\frac{1}{10}$ in. thick.

DOUBTFUL SPECIES.

? ZANONIA; leaves 5 by 2 in. narrow-oblong rounded at the base, tendrils lateral.

CHITTAGONG; *H. f. & T.*—The example contains neither flowers nor fruit, but has all the appearance of *Zanonia* to which genus the collectors referred it in the field.—The only other species of the genus (collected by Beccari in Borneo) has the seed (including the wings) 6 in. broad curved lunate.

29. ALSOMITRA, *Bth. & Hk. f.*

Large climbers; tendrils simple or 2-fid. *Leaves* with 3 oblong entire leaflets. *Flowers* small, diœcious, white, in compound panicles, with filiform branches. MALE: calyx rotate, 5-partite, segments oblong, acute; corolla rotate, 5-partite, segments obtuse; stamens 5, filaments short, near together at the base; anthers small, oblong, straight, 1-celled. FEMALE: calyx and corolla as in the male; ovary elongate-clavate, 1-celled; styles 3–4, conical, with semi-lunate stigmas; ovules very many, pendulous; placentas 3, thick, vertical, parietal. *Capsule* large, elongate-clavate, truncate and 3-valved at the apex. *Seeds* very many, compressed, vertical, in six rows, much corrugated, incised or horned on the margin with a terminal membranous wing longer than the seed or 0.—DISTRIB. Species 3–5, extending from Nipal through Malaya to North Australia.

1. **A. sarcophylla,** *Hook. f. in Gen. Pl.* i. 840; leaves very fleshy, fruit $1\frac{3}{4}$ by $\frac{3}{8}$ in. at the top, seeds including the wing $\frac{5}{8}$ in. very verrucose on the rounded faces. *Kurz in Journ. As. Soc.* 1878, pt. ii. 106. Zanonia sarcophylla, *Wall. Pl. As. Rar.* t. 133; *Cat.* 3724.

BIRMA; from MANDALAY to PROME, *Wallich, Kurz.*—DISTRIB. Siam.

Leaflets $2\frac{1}{2}$ by $1\frac{3}{4}$ in., obtuse; petiolule scarcely $\frac{1}{4}$ in. *Seeds* black, not much compressed, narrowed nearly to a point at the base with 2 flat thin (not 2-fid) curved horns at the apex, between which rises the wing.

2. **A. clavigera,** *Hook. f. in Gen. Pl.* i. 840; leaves herbaceous, fruit 3 by $\frac{3}{4}$ in. at the top, seeds including the wing 1 in. slightly muricate on the flat faces. Zanonia clavigera, *Wall. Pl. As. Rar.* ii. p. 28, *partly*?; *Cat.* 3725.

SIKKIM, ascending to 4000 ft., *J. D. H., Gamble, C. B. Clarke.* KHASIA MTS., alt. 3000–4000 ft.; *H. f. & T.* SILHET; *Wallich.* TENASSERIM; *Helfer* (Kew Distrib. No. 2520).

Leaflets 3 by $1\frac{1}{2}$ in., acute; petiolule often exceeding $\frac{1}{2}$ in. *Seeds* yellowish-white, much flattened, with several deep triangular spinose teeth at the apex, teeth of 2 lamellæ, between which the wing is inserted, split in the plane of complanation of the fruit, and the wing springing from these narrow splits.—Wallich's description of the seed of *Z. clavigera* is incorrect and appears to be taken from that of *Z. indica*, which grows in the same locality.

VAR.? *Hookeri*; seeds without any wing.—Khasia Mts., alt. 3000–4800 ft.; *J. D. H.*—The example is a stout leafless one with large ripe fruits. The seeds are in situ in the capsule so that the wing cannot have been broken off (as happens with seeds of *Zanonia* kept separate). This may be an accidental var. of *A. clavigera* or it may be a new species.

ORDER LXVI. **BEGONIACEÆ.** (By C. B. Clarke.)

Succulent herbs or undershrubs; stem often reduced to a rhizome or tuber. *Leaves* alternate (sometimes falsely whorled in *B. verticillata*), more or less unequal-sided, entire toothed or lobed; stipules 2, free, frequently deciduous. *Peduncles* axillary, divided into dichotomous cymes, the branches and bracts at their divisions generally opposite. *Flowers* white rose or yellow, showy, sometimes small, monœcious. MALE: perianth (of the only Indian genus) of 2 outer valvate opposite sepaloid segments, and 2–0 inner smaller segments; stamens indefinite often very many, free or monadelphous, anthers narrowly obovoid. FEMALE: perianth (of the only Indian genus) of 5–2 segments. *Ovary* inferior (in *Hildebrandia* half-superior), 2–3–4-celled; placentas vertical, axile (at the time of æstivation), divided or simple; styles 2–4, free or combined at the base, stigmas branched or tortuous; ovules very many. *Fruit* capsular, more rarely succulent, often winged, variously dehiscing or irregularly breaking up. *Seeds* very many, minute, globose or narrow cylindric, testa reticulated: albumen very scanty or 0.—DISTRIB. Species 400 (of which 398 belong to the genus *Begonia*), in all tropical moist countries; not yet met with in Australia.

1. **BEGONIA,** *Linn.*

Character of the Order.

SECT. I. **Casparya.** *Stamens* numerous, shortly monadelphous; anthers narrowly oblong, connective slightly produced, obtuse. *Ovary* 4-celled (in *B. Candollei* 3-celled), placentas 2-fid or 2-partite. *Fruit* more or less fleshy, not dehiscing on the faces; carpels not much compressed, nor having their backs produced into a thin wing. (None small: leaves in all very unequal at the base.)

1. **B. Roxburghii,** *A. DC. Prodr.* xv. pt. i. 398; stem lengthened with inflorescence clustered near the axils, leaves ovate nearly glabrous sinuate-toothed scarcely serrate, fruit subpyramidal 4-celled very succulent angles obtuse ending in 4 small horns upwards. *Kurz in Journ. As. Soc.* 1877, pt. ii. 107. B. malabarica, *Roxb. Fl. Ind.* iii. 648, *not of Lamk.* Diploclinium Roxburghii, *Miq. Fl. Ind. Bat.* i. pt. i. p. 692. Casparya? oligocarpa and polycarpa, *DC. Prodr.* xv. pt. i. 276, 277.

From NIPAL to BURMA; not uncommon in NORTH and EAST BENGAL with ASSAM, ascending to 4000 ft.

Root fibrous, not tuberous. *Stem* usually 1–3 ft., erect, succulent, glabrous or minutely pubescent when young. *Leaves* 6–9 in., acuminate, glabrous or minutely pubescent on the nerves of both surfaces; petiole 2–5 in.; stipules lanceolate, glabrous, deciduous. *Cymes* short, axillary, dichotomous, with narrow lanceolate linear bracts, often few-flowered, producing but one or two fruits from each axil. MALE FL.: sepals 2, large, glabrous, nearly white; petals usually 2, smaller than the sepals, white or nearly so; stamens about 50. FEMALE: ovary cells 4; placentas very

thick, succulent, equally 2-partite; styles 4, 2-fid nearly from the base, stigmas winding spirally with 3 turns. *Fruit* ½–⅝ in. diam pendent; walls very thick, succulent, indehiscent or finally dehiscent at the angles. *Seeds* shortly ellipsoid, somewhat obovoid.—Cathcart *Ic. Ined.* represents the cells of the ovary as occasionally 3 which is not improbable, or his artist may have confounded *B. Candollei* (No. 4) with the present species.

2. **B. silhetensis,** *C. B. Clarke*; stemless, inflorescence shorter than the petioles, leaves ovate finely denticulate hardly serrate or lobed, fruit globose thick-walled 4-celled densely covered with shaggy brown hair. B. gigantea, *Wall. Cat.* 3677 B. Casparya? silhetensis, *A. DC. Prodr.* xv. pt. i. 277. Begonia sp., *Wall. Cat.* 9107.

KHASIA Mts.; *Wallich.* EAST BENGAL; *Griffith* (Kew Distrib. No. 2569). CACHAR; *Keenan.*

Rootstock short, thick, fibrous on all sides, scarcely tuberous. *Leaves* 6 in., broadly ovate, not acuminate, shaggy on both surfaces in Griffith's examples, only slightly hairy in Wallich's. *Petiole* 6–18 in., hirsute in Griffith's examples, less hairy in Wallich's. *Scapes* 2–4 in., 1–7-flowered. MALE: sepals 2, hairy without, ⅔ in. in Griffith's examples, smaller nearly glabrous in Wallich's; petals 2, smaller than the sepals, glabrous; stamens numerous, shortly monadelphous, anthers narrowly oblong. FEMALE: styles bifid with tortuose stigmas. *Fruit* ½ in. and upwards in diam., globose or ovoid, without angles or protuberances. *Seeds* many, shining brown, shortly ellipsoid.—Griffith's No. 2569 (with which Wallich's No. 3677 B agrees), differs considerably in hairiness and in size of the flower from Wallich's No. 9107 on which A. DC. founded his *Casparya? silhetensis*: two species are possibly here mixed, but the material is not sufficient to justify a new species.

3. **B. tessaricarpa,** *C. B. Clarke*; nearly stemless, inflorescence much shorter than the petioles, leaves ovate nearly glabrous sinuate-denticulate hardly serrate, fruit subpyramidal 4-celled laxly hairy, carpels acutely keeled and ending upwards in a short linear patent horn.

ASSAM; *Griffith* (Kew Distrib. No. 2586).

Creeping stem 0–2 in. *Leaves* 2–4 in., broadly ovate, glabrous or minutely pubescent on the nerves beneath; petiole 6–12 in., pubescent upwards. *Inflorescence* 2–4 in. *Flowers* much smaller and fruit less succulent than in *B. Roxburghii.* *Fruit* about ⅜ in. diam., slightly pubescent.—This solitary example may be possibly a stunted example of *B. Roxburghii*, from which it does not differ in any essential particular though it is very unlike it in general aspect; the seeds are alike.

4. **B. inflata,** *C. B. Clarke*; stem lengthened, inflorescence axillary, leaves oblong-lanceolate glabrous or nearly so sinuate-dentate scarcely serrate, fruit 3-celled.

DARJEELING, alt. 3000 ft.; *C. B. Clarke.* BHOTAN? *Griffith* (Kew Distrib. No. 2587).

Erect, 3–4 ft., branched. *Leaves* 4 by 1¼–1½ in., acuminate, very unequally cordate; petiole ¼–¾ in.; stipules lanceolate-subulate, glabrous. *Flowers* in short axillary dichotomous cymes from several axils on each branch; bracts lanceolate-subulate. MALE: sepals 2, white, obovate, glabrous; petals 2, linear-obovate; stamens about 50, scarcely monadelphous; anthers narrow-oblong; connective produced, obtuse. FEMALE: perianth of 4 segments; ovary 3-celled, placentas 2-fid. *Fruit* ⅝ in. diam., trigonous or almost triquetrous; carpels round, as it were inflated, with a narrow line down the back, glabrous or nearly so, indehiscent or probably at length dehiscing down the ridges as in *R. Roxburghii.* *Seeds* short, ellipsoid somewhat obovoid.—Griffith's examples are in good fruit but the locality is doubtful: his ticket is marked "Umb. ascent. 4 day."

5. **B. Dux,** *C. B. Clarke*; stem lengthened, inflorescence axillary not diffuse, leaves ovate with scattered hairs above denticulate somewhat ciliate.

MOULMEIN; Moolee alt. 6000 ft.; *Parish.*

Stem exceeding a foot, succulent, tubercular. *Leaves* 8 in., acuminate, much auricled on one side at the base, somewhat angular, pubescent on the nerves beneath; petiole 4 in., pubescent upwards; stipules ¾ in., ovate-lanceolate, glabrous, persistent. *Flowers* (all male in the solitary example) large, glabrous, in short few-flowered cymes with bracts resembling the stipules. *Sepals* 2, round; petals 2, narrower. *Stamens* very many, shortly monadelphous; anthers narrow-oblong; connective hardly produced.—The section is doubtful, the female flowers being unknown: it may be a *Platycentrum*: Parish remarks that it looks like *B. Rex*; but the thick erect tall stem differs.

SECT. II. **Alæcida.** *Fruit* triquetrous, faces with a medial line; carpels dehiscing dorsally, angles with short subequal wings below the middle; placentas divided.—Small small-flowered plants; filaments monadelphous; styles connate.

6. **B. alæcida,** *C. B. Clarke*; stem branched, cymes elongate subproliferous laxly pubescent, fruit inflated glandular-pubescent.

MOULMEIN; *Parish.*

Rootstock small, fibrous. *Stem* 3 in., nearly glabrous. *Leaves* 1½–4½ in. diam., cordate, round, minutely denticulate, puberulous-punctate above, nearly glabrous beneath; petiole 1–2½ in.; stipules ovate, acute, minute. *Cymes* 3–6 in., weak, somewhat panicled; bracts small, ovate, persistent, with lax hairs. MALE: sepals 2, round; petals 2, narrow-oblong; stamens not very many; anthers very short, obovoid; connective not produced. FEMALE: styles united a long way, stigmas lunate; ovary with glandular hairs. *Capsule* scarcely ¼ in. broad including the wings, ripe green, with 6 lines equally diverging from the base of the styles. *Seeds* short, ellipsoid.

7. **B. tricuspidata,** *C. B. Clarke*; stem short or 0, leaves ovate crenate puberulous on the nerves beneath, scape pubescent, capsule stellately tricuspidate glabrous.

MOULMEIN; *Parish.*

Rootstock small, fibrous. *Stem* sometimes 1–2 in., pubescent. *Leaves* round or ovate, somewhat cordate, crenate or nearly entire, with scattered minute hairs above; petiole ¼–1 in., pubescent; stipules minute. *Cymes* 2–3 in., minutely pubescent; bracts ovate, minute. MALE: sepals 2, obovate; petals 2, narrowly obovate; stamens not many; anthers very short, ovoid; connective not produced. FEMALE: perianth of 4 segments, much as in the male: styles combined below, each with two curved branches. *Capsule* less than ¼ in. broad including the wings, with six lines equally diverging from the base of the styles, wings acute. *Seeds* very small, shortly ellipsoid.

8. **B. triradiata,** *C. B. Clarke*; stem short or 0, leaves ovate serrate or doubly crenate glabrous and white beneath, scape glabrous, capsule stellately 3-rayed glabrous.

MOULMEIN; *Parish.*

Rootstock a small cluster of tubers. *Stem* 0–¼ in., glabrous. *Leaves* ¾–1¼ in., somewhat cordate, incise-crenate, minutely pilose above; petiole ¼–¾ in., glabrous; stipules small, lanceolate. *Cymes* 2–3 in., glabrous; bracts small, lanceolate, glabrous, persistent; flowers pink. *Flowers* fruit and seeds closely resembling those of *B. tricuspidata.*

SECT. III. **Knesebeckia.** *Capsule* 3-celled, triquetrous, the angles produced into three often unequal papery wings; faces flat with a rib or line down

the middle; dehiscing by the falling away of 2 or 3 of the faces; placentas 2-fid. *Stamens* very shortly monadelphous, anthers obovoid, connective not produced.

A. Segments of female flower 5 (rarely 6), imbricate, inner smaller, innermost often smallest or 0. Sect. *Knesebeckia* A. DC.

* *Ovary and young capsule very pubescent.* (See also 12. *B. Josephi.*)

9. **B. picta,** *Sm. Exot. Bot.* t. 101; leaves ovate acuminate, capsule with one wing much elongate. *Hook. Exot. Fl.* ii. t. 89; *Wall. Cat.* 3685 B *and part of* A; *Bot. Mag.* t. 2962; *A. DC. Prodr.* xv. pt. i. 312. B. echinata, *Royle Ill.* 313, t. 80. B. erosa, *Wall. Cat.* 3688, *partly*.

HIMALAYA, alt. 2000–6000 ft.; from KUNAWUR to BHOTAN, frequent. KHASIA MTS., alt. 3000–4000 ft.; *H. f. & T.* Throughout CHOTA NAGPUR, alt. 1000–4200 ft.; *C. B. Clarke.*

Rootstock of one or few tubers; plant 6–15 in., the inflorescence scarcely exceeding the leaves, stem glabrous or obscurely pubescent. *Leaves* 3–5 by 2–3 in., nearly equally cordate, doubly finely serrate, pilose above, villous on the nerves beneath; petiole of the cauline leaf usually 1 in. at least; stipules lanceolate, hairy, scarcely exceeding the leaves. *Peduncle* more or less pubescent upwards; bracts oblong-lanceolate, persistent, pubescent. MALE: outer segments 2, pubescent; petals 2, smaller; stamens shortly monadelphous, about 30; anthers obovoid; connective not produced. FEMALE: perianth of 5 segments, outer larger, pubescent. *Styles* 3, nearly separate, divided half way up into two tortuose branches. *Capsule* large, 1 in., usually pubescent, sometimes nearly glabrous when quite ripe; one wing $\frac{1}{4}$ in. broad, another $\frac{1}{3}$ in., the third $1\frac{1}{2}$ in. in a large example; styles persistent; wings slightly ascending, dehiscing by the three faces falling off. *Seeds* light brown, shortly ellipsoid.—Flowers pale rose, medium large; leaves often variegated.

10. **B. Satrapis,** *C. B. Clarke*; leaves reniform or shortly ovate-cordate not acute, capsule with 3 wings no one of them greatly elongate.

SIKKIM; above the Rungait, alt. 2000 ft.; *Herb. Griffith, C. B. Clarke, Dr. Treutler.*

Rootstock of a few tubers. *Stem* erect, usually elongate above the leaves, pubescent, whole plant 12–18 in. *Leaves* 2–3 by 3–4 in., nearly equally cordate, minutely denticulate-ciliate, closely pubescent above, rufous-villous on the nerves beneath; petiole of the cauline leaf usually short often less than 1 in.; stipules lanceolate, pubescent. *Peduncle* elongate, very pubescent, bright rose-red, often rising 6 in. above the highest leaf; bracts oblong-lanceolate, persistent, very hairy, laciniate, sometimes divided to the base. MALE: sepals 2, pubescent; petals 2, smaller; stamens shortly monadelphous, about 50; anthers obovoid; connective not produced. FEMALE: perianth of 5 (or 6) segments, outer larger, pubescent; styles 3, nearly separate, each divided half-way up into two tortuose branches. *Capsule* large, very pubescent, length $\frac{3}{4}$ in., wings not very unequal about $\frac{1}{4}$ in. broad (but the capsule not well ripe). *Seeds* (not well ripe) like those of *B. picta* but narrower.—A very beautiful plant with bright rose flowers.

** *Ovary and capsule glabrous* (except sometimes in 12, *B. Josephi*).

11. **B. Evansiana,** *Andr. Bot. Rep.* t. 627; stem elongate, leaves ovate-cordate acute unequal at the base, bracts glabrous oblong-obovate, capsule with three unequal wings. *Bot. Mag.* t. 1473; *A. DC. Prodr.* xv. pt. i. 313. B. obliqua, *Thunb.*; *Banks Ic. Kæmpf.* t. 20. B. sinensis, *A. DC. l. c. ex descr.*

PINANG, *Evans* ex Andrews.—DISTRIB. Java, China, Japan.

Rootstock tuberous (ex A. DC.). *Stem* 2 ft., nearly glabrous; peduncles from the upper axils, elongate, several times dichotomous. *Leaves* 3–6 in., somewhat angular and denticulated; petiole 2–6 in.; stipules ovate-lanceolate, glabrous. *Flowers*, bracts, and pedicels rose. MALE: sepals 2, round, glabrous; petals 2, smaller; stamens very many (more than 50), long monadelphous; anthers obovoid; connective not produced. FEMALE: perianth-segments 5, glabrous, inner smaller; styles 3, nearly distinct, divided about half-way into two tortuous branches. *Capsule* ¾ by 1¼ in. including the wings, the faces ribbed down the middle; styles persistent; wings slightly ascending; capsule dehiscing by two valves on each face, one valve on either side of the central rib.—There is no example from Pinang in the Kew Herbarium.

12. **B. Josephi,** *A. DC. Prodr.* xv. pt. i. 313; little hairy, leaves ovate little unequal at the base peltate (at least when young), capsule 3-winged, one wing much the longer. B. scutata, *Wall. Cat.* 3686 A, *not of A. DC.*

SIKKIM, alt. 3000–8000 ft., the commonest species. KHASIA MTS., alt. 4000–6000 ft.; *H. f. & T.*

Very variable in size and habit, stemless or stem leafy, always easily recognised by the peltate leaves. *Rootstock* of one or few tubers. *Stem* generally 0. Radical *leaves* (on petioles 4–10 in.) often 6 in., sometimes nearly regularly ovate acuminate, acutely 3-lobed or orbicular with numerous acute lobes, serrate or doubly serrate or less often almost entire, usually nearly glabrous but often slightly pubescent on the nerves beneath sometimes weakly pilose above; stipules ovate, deciduous, glabrous or nearly so. *Scape* 1 ft., usually repeatedly dichotomous with long lower branches, soon entirely naked; bracts caducous, caulescent and leafy; flowers rather small, rose. MALE: sepals 2, caducous; petals 2, smaller; stamens shortly monadelphous, sometimes 8-30; anthers obovoid; connective not produced. FEMALE: perianth-segments 4–6; styles 3, nearly separate, 2-fid near the top, stigmas in large specimens tortuous, in small simple lunate. *Capsule* ½ by ⅞ in. including the wings, styles rsistent, upper margin of the wing horizontal, narrow between the two very rrow wings, the other faces broader below; dehiscing first by 4 lines, two on her side of each of the two narrow wings. *Seeds* short-ellipsoid.—All three varie- are equally common in Sikkim and pass into each other: only the typical been collected in Khasia. The plant is believed to be very plentiful in West otan and East Nipal, but all the numerous Himalayan examples at Kew are m Sikkim itself. As regards the name: Wallich's Begonias are greatly mixed: n on the same sheets. The three sheets of No. 3686 at Kew are *B. scutata*, DC., but the type sheet of *B. scutata* No. 3686 in the Linnæan Society's Her- ium is *B. Josephi*, A. DC., which is also mixed with *B. picta* in the sheet of 5 A.

VAR. 1. *typica*; peduncles elongated, leaves large often lobed, ovary flowers and sule glabrous. B. Josephi, *A. DC. l. c.*

VAR. 2. *macrocarpa*, A. DC. l. c.; ovary flowers and capsule with lax hairs.—Both large and very small plants occur with a hairy ovary; the fruit is not larger than in the typical form.

VAR. 3. *minima*; scape 2–3 in., leaf small without lobes, ovary usually glabrous.

13. **B. pedunculosa,** *Wall. Pl. As. Rar.* 82, t. 97; *Cat.* 3672 A *not* B; caulescent with subterminal inflorescence, leaves narrow-oblong acute from an unequally cordate base pilose above, stipules and bracts persistent. *A. DC. Prodr.* xv. pt. i. 314.

KHASIA MTS., alt. 3000–6000 ft., frequent. BHOTAN; *Griffith.*

Rootstock tuberous, or elongate woody. *Stem* erect, 4–8 in., usually with some brown hairs and zigzag, not unfrequently bearing bulbils in the upper axils. *Leaves* 2–3 in., sharply doubly-serrate, pubescent on the nerves beneath; petiole usually short (less than 1 in.) but sometimes elongate; stipules ⅛–¼ in., ovate, acute, ciliate. *Cyme* repeatedly dichotomous; bracts ovate, acute, ciliate; flowers small, rose-red.

MALE: sepals 2, glabrous or nearly so; petals 2, smaller; stamens shortly monadelphous, about 30, anthers obovoid, connective not produced. FEMALE: perianth, lobes 4–5, persistent, somewhat enlarged on the fruit; ovary glabrous; styles 3 nearly separate, divided near the top into two curved branches. *Capsule* scarcely $\frac{1}{4}$ by $\frac{3}{8}$–$\frac{1}{2}$ in. including the wing, upper margin of the longest wing horizontal; capsule dehiscing by its three faces falling off. *Seeds* short-ellipsoid.

14. **B. surculigera,** *Kurz in Flora* 1871, 296; weak, caulescent with terminal inflorescence, leaves cordate-ovate crenate and denticulate, bracts minute ovate persistent, capsule with 3 subequal wings.

BRITISH BURMA; Akyab and Arracan, on low sandstone hills, *Kurz.*

Weak, succulent, 3–10 in., glabrous or slightly glandular-pubescent, frequently proliferous, or the peduncle going off into a runner. *Leaves* 1–1$\frac{1}{2}$ by 1–1$\frac{1}{4}$ in., nearly glabrous, obscurely acuminate, obtuse at the apex, base equal or unequal; petiole $\frac{1}{4}$ in.; stipules small, ovate, glabrous. *Peduncle* weak, terminal, dichotomous, lax, slightly glandular-pubescent. *Flowers* small (white *ex Kurz*). MALE: sepals 2, obovate, glabrous or with few paleaceous hairs; petals 2, much smaller; stamens monadelphous, about 8, anthers obovoid, connective apiculate, but not produced. FEMALE: perianth-segments 5; ovary 3-celled, glabrous, placentas bipartite (*Kurz*); styles 3, nearly distinct, divided only near the top, stigmas lunate. *Capsule* less than $\frac{1}{5}$ by $\frac{3}{8}$ in. including the wings, styles deciduous in the few examples seen, upper margin of the wings convex, dehiscing by its three faces. *Seeds* short-ellipsoid.

15. **B. modestiflora,** *Kurz in Flora* 1871, 296; caulescent, inflorescence terminal elongate and panicled in fruit, leaves ovate-acuminate from a very oblique base denticulate-serrate nearly glabrous, capsule unequally 3-winged. B. parviflora, *Wall. Cat.* 3674.

Morung Hills, NIPAL; *Hamilton.* BRITISH BURMA: Akyab on sandstone roc[illegible] *Kurz.* MOULMEIN on limestone rocks, *Parish.*—DISTRIB. Yunan.

Glabrous or nearly so. *Rootstock* tuberous. *Stem* erect, sometimes a fo[illegible] *Leaves* 3–4 by 2 in., not lobed, caudate-acuminate, base very unequally cordate[illegible] very obliquely subtruncate; petiole 1$\frac{1}{2}$–2$\frac{1}{2}$ in.; stipules small, lanceolate. *Cy[illegible]* elongate, narrow, slightly panicled; bracts small, lanceolate, ciliate, caduco[illegible] flowers numerous, small, white. MALE: sepals 2, petals 2, smaller; stamens (ab[illegible] 12), free ex Kurz (distinctly monadelphous ex Parish), anthers obovoid, connect[illegible] slightly produced in a triangular point. FEMALE: perianth-segments 5, much en[illegible]larged in fruit; ovary glabrous, 3-celled, placentas 2-partite; styles 3, nearly distin[illegible] broader upwards, stigma lunate. *Capsule* rather more than $\frac{1}{2}$ by 1 in. includ[illegible] the wings; styles deciduous; 3 wings prominent, their upper margins horizontal, [illegible] often very greatly produced; capsule dehiscing by the three faces. *Seeds* sh[illegible] ellipsoid.—Kurz placed this species next *B. scutata,* but the 5 female perianth se[illegible] ments refer it to *Knesebeckia* proper, and not to *Trilobaria,* A. DC. Possibly two species are mixed here. Wallich's very immature specimen has exceedingly small flowers and weak inflorescence and is referred by Meissner in ms. to *B. hydrophila.*

16. **B. parvuliflora,** *A. DC. Prodr.* xv. pt. i. 355; stem with 1 or no leaf, leaves round or ovate-cordate subequal at the base, capsule 3-winged one of the wings very long produced. B. Lobbiana, *A. DC. ms. not B. Lobbii, Hassk.* B. velutina, *Parish ms.*; *Kurz in Journ. As. Soc.* 1873, pt. ii. 81.

MOULMEIN and MARTABAN; *T. Lobb*; on limestone rocks, *Parish.* TENASSERIM; *Dr. Stoliczka* (ex Kurz).

Rootstock of 1 or 2 tubers. *Stem* 0–2 in., glabrous or nearly so, whole plant 6–12 in. *Leaves* 1–3 in. diam., softly pubescent above and on the nerves beneath, sometimes nearly glabrous, doubly serrate-ciliate or simply crenate; petiole of the cauline leaf $\frac{1}{2}$–1 in., of the radical leaves often much longer, slightly pubescent; stipules very

small, lanceolate. *Peduncles* 4–10 in., nearly glabrous, laxly dichotomous; bracts $\frac{1}{8}$–$\frac{1}{4}$ in., lanceolate, sometimes fimbriate; flowers not many, small, white tinged with rose. MALE: sepals 2, broad-elliptic, glabrous or with a few scattered hairs; petals 2, narrowly oblong; stamens about 25, monadelphous, anthers obovoid, connective not produced. FEMALE: perianth of 5 or 4 segments; styles 3, somewhat combined, each divided into two curved branches. *Capsule* $\frac{1}{5}$ by $\frac{1}{2}$ in. including the wings, one wing very long, margins of all extended horizontally from the summit of the capsule, dehiscing on all three faces. *Seeds* short-ellipsoid.—Kurz (*in Journ. As. Soc.* 1877, pt. ii. 107) keeps *B. parvuliflora* "a caulescent wholly glabrous herb" distinct from *B. velutina* "a scapigerous herb with leaves pilose above:" but A. DC.'s type of *B. parvuliflora* (marked by him *B. Lobbiana*) has the leaves decidedly pilose above and the stems not more caulescent than some of Parish's *B. velutina*. The only difference between the two is that in *B. velutina* the leaves are often beautifully variegated and doubly serrated; but not always Parish's specimens.

17. **B. gemmipara,** *Hook. f. Ill. Him. Pl.* t. 14; caulescent, leaves incise-serrate or lobed, peduncles axillary short few-flowered, 2 large round persistent bracts on each pedicel near the flower, seeds with adpressed papillæ. *A. DC. Prodr.* xv. pt. i. 314.

SIKKIM, alt. 6000–11,000 ft.; plentiful round Darjeeling.

Rootstock tuberous. *Stem* 6–16 in., succulent, glabrous. *Leaves* ovate-cordate, acuminate, often with acute or lanceolate lobes, glabrous beneath, often pilose above; petiole 1–3 in.; stipules ovate. *Peduncles* short, axillary, little divided, pedicels longer; flowers pendulous, medium-sized, white or with rose stripes, usually monœcious. MALE: sepals 2; petals 2, narrower; stamens numerous, shortly monadelphous, anthers obovoid, connective not produced. FEMALE: perianth-segments 5, nearly equal, persistent; styles 3, nearly distinct, broader upwards, stigmas lunate. *Capsule* $\frac{1}{4}$ by $\frac{1}{2}$ in. including the wings, somewhat inflated, with a medial line on each face; wings nearly equal, upper margins horizontal.—In some of the axils the peduncle instead of producing flowers is very shortly once or twice divided, each branch terminating in 4 quadrangular cups, each packed closely with oblong viviparous bulbils. Alph. DC. gives diœcious as a character of his section *Putzeysia*, but this, the only species of that section is, as all other Indian Begonias, monœcious or occasionally diœcious.

18. **B. cordifolia,** *Thwaites Enum.* 129; stemless, leaves orbicular-cordate crenate-serrate, capsule with 3 subequal not broad wings. *A. DC. Prodr.* xv. pt. i. 328; B. Arnottiana, *A. DC. l. c.* 322. Diploclinium Arnottianum and cordifolium, *Wight Ic.* t. 1815, 1816.

South DECCAN PENINSULA; Courtallum; *Wight*. CEYLON; *Thwaites*.

Rootstock tuberous. *Leaves* $1\frac{1}{2}$–3 in. diam., rarely subacute, nearly equal at the base, pilose above, laxly pubescent on the nerves beneath; petiole 2–5 in., laxly pubescent; stipules $\frac{3}{8}$ in., ovate-lanceolate, glabrous. *Scape* 6 in., repeatedly dichotomous; flowers medium-sized, numerous; bracts $\frac{1}{4}$ in., lanceolate. MALE: sepals 2, round; petals 2, smaller, narrow; stamens numerous, shortly monadelphous, anthers obovoid, connective not produced. FEMALE: perianth-segments 5–4- (3- in Wight's Icon 3-lobed); styles 3, nearly separate, divided half way up into two curved branches. *Capsule* $\frac{3}{8}$ by $\frac{3}{8}$ in. including the wings, perianth deciduous, styles persistent; wings narrow, upper margin rounded or shortly horizontal, dehiscing on all three faces. *Seeds* shortly ellipsoid.—Wight finally united his *D. Arnottianum* with his *D. cordifolium*. Alph. DC. separated them again on the sole ground that *D. Arnottianum* had 4 segments to the female perianth, *D. cordifolium* only 3. But in Wight's specimens of *B. cordifolium* all the female flowers examined have 5. The var. *insularis* of A. DC. founded on Mr. Thwaites' No. 3584 has the leaves acute with the nerves beneath more shaggy than in the type.

B. Segments of female flower 3, with sometimes a small fourth; two outer large, third small lateral. (Trilobaria, *A. DC.*)

19. **B. amœna,** *Wall. Cat.* 3682; leaves ovate or oblong caudate-acuminate equally cordate, capsule-wings nearly equal, seeds slender cylindric, tip curved acute. *A. DC. Prodr.* xv. pt. i. 327. B. tenella, *Don Prodr.* 223; *Wall. Cat.* 3681. B. erosa, *Wall. Cat.* 3688, *partly.*

Temperate Central and Western HIMALAYA; alt. 5000–7000 ft. from DALHOUSIE to SIKKIM; among the commonest species at Simla.

Rhizome tuberous. *Stem* usually 0 or very short, in Wallich's specimen nearly 1 ft. *Leaves* 3 by 2 in., glabrous, crenate-serrate; petiole 2–3 in.; stipules ovate, glabrous. *Scape* 3–8 in., glabrous, loosely dichotomous, few-flowered; bracts ovate-oblong, caducous; flowers medium-sized. MALE: sepals 2, ovate; petals 2, elliptic, smaller; stamens numerous, shortly monadelphous; anthers obovoid, connective not produced. FEMALE: perianth-segments 2, large, ovate, opposite, and one smaller lateral, all enlarged and persistent on the fruit; styles 3, nearly separate, divided near the top into two curved branches. *Capsule* ⅝ by nearly ¾ in. including the wings, styles persistent, upper margins of wings horizontal, dehiscing on all the faces. *Seeds* smooth, reticulated; far more elongate than those of any other Indian species.

20. **B. scutata,** *Wall. Cat.* 3686, *partly*; leaves ovate cordate-acuminate often unequal at the base, capsule-wings unequal, larger one much ascending. *A. DC. Prodr.* xv. pt. i. 328; ? *Kurz in Journ. As. Soc.* 1877, pt. ii. 108. B. rubella, *Wall. Cat.* 3687.

NIPAL; *Wallich.* East Nipal, alt. 4000 ft.; *J. D. H.* SIKKIM, alt. 4000 ft.; *C. B. Clarke.* ? BURMA, *Kurz.*

Nearly glabrous. *Rootstock* tuberous. *Stem* in fruit often leafless, scape-like. *Leaves* 2–6 in., sinuate-toothed or slightly angular not serrate, glabrous or minutely pubescent on the nerves beneath; petiole very long, of the radical leaves often 6 in.; stipules ovate-lanceolate, deciduous. *Scape* or stem reaching 9 in., laxly dichotomous upwards; bracts oblong, acute, caducous; flowers medium-sized, many or few. MALE: sepals 2, round; petals 2, narrower; stamens numerous, shortly monadelphous; anthers obovoid, connective not produced. FEMALE: perianth-segments 3, 2 larger round opposite, the third smaller lateral, all deciduous; styles 3, nearly distinct, divided about half-way up into two curved branches. *Capsule* nearly ½ by ¾ in. including the wings; styles persistent; upper margin of the wings concave, dehiscing by all three faces. *Seeds* short-ellipsoid.

21. **B. ovatifolia,** *A. DC. Prodr.* xv. pt. i. 328; stem short or 0, leaves ovate sometimes acute more or less serrate equal or scarcely unequal at the base, capsule-wings unequal the larger slightly ascending. B. subovata, *Wall. Cat.* 3683.

SIKKIM, alt. 4000 ft.; *J. D. H.*; alt. 1000 ft.; *C. B. Clarke, Dr. Treutler.* KHASIA MTS., alt. 4000 ft.; *H. f. & T.*

Rootstock of several tubers; whole plant rarely exceeding 6 in. Cauline *leaf* 1 or 0. *Leaves* 1–2½ in. diam., roundish or ovate, cordate or scarcely rounded at the base, pubescent on the nerves beneath; petiole 1–4 in., pilose above, usually pubescent towards its summit; stipules very small, lanceolate. *Peduncles* lax, succulent, glabrous or slightly pubescent, 4–8-flowered; bracts oblong or lanceolate; flowers rather small, white or rose. MALE: sepals 2, obovate; petals 2, narrow-obovate; stamens about 20, shortly monadelphous, anthers obovoid, connective not produced. FEMALE: perianth-segments 3, 2 obovate subequal, 1 lateral much smaller, deciduous; styles 3, nearly distinct, divided half-way up into two curved branches. *Capsule* ½ by 1 in. including the wings, styles persistent, upper margin of longer wing straight or convex upwards, capsule dehiscing on all three faces. *Seeds* short-ellipsoid.

VAR. *cretacea*; leaves stouter shaggy on the nerves beneath, peduncles firmer, female perianth of 4 segments (almost exactly like the male).—Bhotan; *Griffith.* (Kew Distrib. No. 2583.) Limestone rocks near Cherra in Khasia, alt. 4000 ft.; *C. B. Clarke.*

22. **B. subperfoliata,** *Parish ms.*; *Kurz in Journ. As. Soc.* 1877, pt. ii. 109; stemless, glabrous, leaves ovate crenate-dentate subpeltate prominently reticulated on both surfaces, bracts laciniated acutely.

MOULMEIN, on limestone rocks; *Parish.*

Root tuberous. *Leaf* solitary, radical, 3½ by 2 in., acute not acuminate, hardly serrate, equal at the base, peltate or the auricles only overlapping; petiole 2–4 in. *Peduncle* 3 in. with about 10 small flowers; bracts ⅕ in., persistent, divided to near the base or sharply serrate. MALE: sepals 2, elliptic; petals 2, narrow-oblong; stamens about 25, much monadelphous, anthers obovoid, connective not produced. FEMALE: perianth very nearly as in the male; styles 3, combined half-way up, stigmas lunate. *Capsule* 3-celled, ⅜ by ½ in. including the wings, styles persistent, wings 2 short 1 longer, upper margin of each horizontal, dehiscing by all three faces. *Seeds* short-ellipsoid.

23. **B. moulmeinensis,** *C. B. Clarke*; stemless, very pubescent throughout, leaves ovate serrate, bracts incise-serrate or laciniate.

MOULMEIN; *T. Lobb* No. 380.

Closely resembling *B. subperfoliata.* The specimens which are in bud differ in pubescence and in the leaf being slightly cordate (not at all peltate), serrate, almost lobed, and not prominently reticulate on either surface.

24. **B. fallax,** *A. DC. Prodr.* xv. pt. i. 329; glabrous or nearly so, leaves elliptic acuminate angular toothed very unequal at the base, capsule equally 3-winged wings narrow their upper margins shortly horizontal. Diploclinium Lindleyanum, *Wight Ic.* t. 1817.

South DECCAN PENINSULA; COURTALLUM and MALABAR; *Wight.*

The branch figured by Wight is 8 in. long with a peduncle from a lower axil and A. DC. conjectures the plant may be suffrutescent. *Leaves* 4 by 2 in.; petiole 1 in.; stipules oblong, deciduous. *Peduncle* many times dichotomous, many-flowered, shorter than the leaf; bracts numerous, minute; flowers medium-sized. MALE: sepals 2, rounded; petals 2, narrow-elliptic; stamens numerous, shortly monadelphous, anthers obovoid, connective not produced. FEMALE: perianth-segments 3, 2 large round, 1 small narrow lateral; styles 3, nearly separate, divided half-way up into two curved branches. *Capsule* ½–⅔ in. long and broad including the wings. *Seeds* shortly-ellipsoid, somewhat obovoid.—Not seen: the above is drawn up from Wight's figure: the plant is of the section *Trilobaria* if all Wight's details are without error.

SECT. IV. **Platycentrum**. *Capsule* 2-celled compressed, triquetrous, having one broad and two narrow papery wings; dehiscing by the falling away of the faces between the wings; placentas 2-fid.

A. Female perianth-segments 4–3.—Genus *Mezierea,* A. DC.

25. **B. gigantea,** *Wall. Cat.* 3677; stem tall unbranched glabrous upwards, peduncles from the upper axils glabrous, male sepals 2. Mezierea nepalensis, *A. DC. Prodr.* xv. pt. i. 406.

NIPAL; *Wallich.* SIKKIM, alt. 3000–6000 ft.; *Herb. Griffith, J. D. H.*; alt. 1000–4000 ft., frequent, *C. B. Clarke.*

Rootstock thick, woody, not tuberous. *Stem* 2–3 ft., rarely branched. *Leaves* 9–12 by 3 in., caudate-acuminate (sometimes larger and ovate), undulate, toothed,

pubescent on the nerves beneath otherwise glabrous, base very unequal deeply auriculed on one side; petiole ¼–⅝ in.; stipules narrow-lanceolate, glabrous, deciduous. *Peduncles* short, dichotomous, with many rather small white or pale pink flowers; bracts ovate, acute, deciduous. MALE: sepals 2, ovate, subacute, glabrous; petals 0; stamens about 40, shortly monadelphous, anthers obovoid, connective not produced. FEMALE: perianth-segments 3, 2 outer ovate subacute resembling but smaller than the male sepals, inner small lateral; ovary (at the time of expanding of the flower) completely 2-celled with 2-fid placentas (exactly as in *Platycentrum*); styles 2–3 (sometimes 4, A. DC.) nearly free, or one free the other two combined, sometimes simply branched upwards, often 3–4-fid and more or less contorted. *Capsule* ¾ by 1 in. including the wing, styles persistent, oblong, concave upon its narrow face (between the two very narrow wings), broad wing extending the whole length of the capsule, its upper margin horizontal convex, narrow face first falling away. *Seeds* ellipsoid.—This is the largest Indian Begonia: the description and remarks of Alph. DC. must have been founded upon very imperfect materials.

26. **B. episcopalis,** *C. B. Clarke*; stem tall much branched pubescent upwards, peduncles axillary, male sepals 4. Mezierea Griffithiana, *A. DC. Prodr.* xv. pt. i. p. 407.

BHOTAN; *Griffith* (Kew Distrib. No. 2504, 2573). KHASIA MTS., alt. 4000 ft.; *H. f. & T., C. B. Clarke.*

Leaves 6 by 1 in., narrow-lanceolate, cordate, toothed, membranous, with scattered pubescence above, very pubescent or almost glabrous on the nerves beneath, base very unequal deeply auricled on one side; petiole ⅛–1½ in.; stipules ⅜ in., very persistent, lanceolate, subulate, glabrous. *Inflorescence* often from the middle and lower axils in short dichotomous peduncles, usually pubescent; bracts oblong-lanceolate, glabrous, persistent; flowers somewhat numerous, rather small. MALE: sepals 2, ovate; petals 0; stamens about 40, shortly monadelphous, anthers obovoid, connective not produced. FEMALE: perianth-segments 4, 2 outer ovate, 2 inner narrow-oblong; styles 3 or 2, nearly free at the base, divided into long curved branches. *Capsule* as in *B. gigantea* but the upper margin of the larger wing is concave and somewhat descending. *Seeds* short-ellipsoid.—In Griffith's Bhotan examples, the stems upwards peduncles and leaves on both surfaces are very pubescent, and the petioles are ⅛–¼ in.; Clarke's examples (from Bishop's Falls,, Shillong) are very nearly glabrous with the petioles 1½ in. The Khasia examples of H. f. & T. are intermediate.

B. Female perianth-segments 4–6.—Sect. *Platycentrum*, A. DC.

* *Connective produced above the anther-cells.*

27. **B. xanthina,** *Hook. Bot. Mag.* t. 4683; leaves large ovate denticulate and angular not ciliate-serrate, petiole hairy, cyme and ovary nearly glabrous, flowers yellow. *A. DC. Prodr.* xv. pt. i. 347. B. xanthina, var. pictifolia, *Bot. Mag.* t. 5102. B. xanthina, var. Lazuli, *Bot. Mag.* t. 5107.

EAST SIKKIM, alt. 4000–5000 ft.; *J. D. H.* Dumsong, BHOTAN, alt. 6000 ft.; *C. B. Clarke.*

Rhizome thick. *Stem* (in the wild examples) 0. *Leaves* 6–8 in., acute, unequally cordate at the base, pubescent on the nerves beneath, otherwise nearly glabrous; petiole 3–4 in.; stipules ovate, acute, glabrous or pubescent. *Scape* 1 ft. with spreading hairs below, nearly glabrous upwards; bracts at its first division ¾ in., oblong-lanceolate, glabrous; flowers medium large, full yellow (in the wild examples). MALE: sepals 2, round; petals 2, elliptic; stamens about 100, shortly monadelphous; connective produced, triangular. FEMALE: perianth-segments 5, outer round, inner gradually smaller; styles 2, shortly combined below, each dividing half-way up into two tortuous branches; ovary (in the wild specimens) glabrous. *Capsule* with the unequal wing very much elongated, descending, its upper margin concave.—In some cultivated specimens, the stem is elongated and leafy.

28. **B. rubro-venia,** *Hook. Bot. Mag.* t. 4689; caulescent, leaves elliptic or lanceolate acuminate entire or slightly angular undulate outer perianth-segments white with rose-red veins. *A. DC. Prodr.* xv. pt. i. 347. B. barbata, *Wall. Cat.* 3679 B, *partly.*

SIKKIM, BHOTAN and KHASIA MTS., alt. 3000–6000 ft., frequent.

Rootstock thick. *Plant* 8–16 in., stem puberulous or minutely pubescent. *Leaves* 3–6 in., usually narrow, sometimes elliptic, shortly pubescent on the nerves beneath otherwise glabrous, base unequal rounded scarcely cordate; petiole 1–2 in.; stipules persistent, lanceolate, caudate, glabrous. *Peduncles* axillary, 3–6 in., usually divided only near the top and few-flowered; bracts like the stipules and persistent; flowers medium-sized. MALE: sepals 2, rounded; petals 2, narrower, white; stamens numerous, very shortly monadelphous; connective produced, obtuse. FEMALE: perianth-segments 5, 3 inner gradually smaller, white; ovary glabrous; styles 2, combined at the base, very tortuous. *Capsule* $\frac{1}{3}$–$\frac{5}{8}$ by 1–1$\frac{1}{4}$ in. including the wings, often recurved in fruit, the broad wing much descending its upper edge concave; broader faces first falling away. *Seeds* ellipsoid.

VAR. *Meisneri,* Wall. Cat. 6294; shortly caulescent, leaves linear-lanceolate very tomentose on the nerves beneath.—Khasia Mts., *Wallich*; alt. 3500 ft., *C. B. Clarke.* —*Leaves* 2–4 by $\frac{1}{4}$–$\frac{1}{2}$ in.; petiole $\frac{1}{4}$–1$\frac{1}{2}$ in., pubescent, tomentose. *Flowers* and *capsules* like those of *B. rubro-venia* but smaller. Wallich's type examples look like a distinct species, but the examples of *C. B. Clarke* connect the two.

29. **B. laciniata,** *Roxb. Fl. Ind.* ii. 649; caulescent, leaves roundly ovate acutely lobed with soft pubescence, petioles brown-tomentose, outer perianth-segments rose-red pubescent on the back, ovary pubescent. *Bot. Mag.* t. 5021; *A. DC. Prodr.* xv. pt. i. 347; *Wall. Cat.* 3678; *Kurz in Journ. As. Soc.* 1877, pt. ii. 107. ? B. palmata, *Don Prodr.* 223. B. Bowringiana, *Champ. in Hook. Kew Journ.* iv. 120; *Bot. Mag.* t. 5182.

NIPAL to BURMA; ascending in SIKKIM to 7000 ft. Very common in KHASIA and CHITTAGONG.—DISTRIB. South China.

Rootstock long, creeping, neither woody nor tuberous. *Stem* 6–24 in., more or less brown-tomentose. *Leaves* 4–6 in. diam., always more or less lobed, lobes usually many, caudate-acuminate, often 2 in. long, ciliate, usually but slightly serrate, rounded or cordate more or less unequally at the base, pilose above, pubescent on the nerves beneath and more or less villous or tomentose; petiole 1$\frac{1}{2}$–4 in.; stipules $\frac{3}{4}$ in., persistent, lanceolate, mucronate, pubescent. *Peduncles* 3–6 in., usually from one or two uppermost axils, tomentose; bracts large, oblong, tomentose; flowers medium, not very many, always more or less glandular-pubescent on the back, from nearly white to deep rose. MALE: sepals 2, long-elliptic; petals 2, narrowly obovate; filaments nearly free, about 50, anthers obovoid; connective little produced, obtuse. FEMALE: perianth-segments 5–4, inner gradually smaller; ovary with pubescent, not mere glandular, roughness; styles 2, divided from near the base into 2 much contorted branches. *Capsule* $\frac{1}{2}$ by 1 in. including the wings, often recurved in fruit, with a descending wing; dehiscing by 4 lines adjacent to, and one on each side of, the two narrow wings. *Seeds* ellipsoid, somewhat obovoid.

VAR.? *flava*; flowers full yellow, leaves green finely serrate, ovary and sepals pubescent or nearly glabrous.—Sikkim, alt. 5000 ft.; *J. D. H., Treutler*; Darjeeling, 7000 ft. alt.; *C. B. Clarke*; *Herb. Griffith* (Kew Distrib. No. 2577).—Perhaps a species: the plant has not the brown-red tint of *B. laciniata,* the leaves are thinner and less softly hairy. Alph. DC. doubts the correctness of the colour of the flowers; it is a full deep yellow as noted on the specimens of *J. D. H.* and *C. B. Clarke,* and as shown in the excellent figure of Cathcart preserved at Kew.

VAR. *tuberculosa*; ovary with glandular tubercles not pubescent, flowers pale pink glabrous.—Sikkim, alt. 6000 ft.; *J. D. H., Treutler.*

30. **B. barbata,** *Wall. Cat.* 3679 A *and part* B; caulescent, leaves not lobed, ovate acuminate hispid beneath denticulate ciliate, bracts cyme and ovary pubescent. *A. DC. Prodr.* xv. pt. i. 348; *not of Kurz.*

From SILHET and CACHAR to BURMA, alt. 0–2000 ft. CHITTAGONG, abundant in the hills.

Rootstock creeping, not thick, nor tuberous. *Stem* decumbent, usually short, with much spreading brown hair. *Leaves* 2–5 in., unequal cordate at the base, hispid on both surfaces, margin very entire; petiole 1–4 in., with spreading hairs; stipules persistent, lanceolate-subulate, ciliate. *Peduncles* from the upper axils, not more than 3 in., pubescent to the summit except in ripe fruit, few-flowered; flowers medium, white to pink. MALE: sepals 2, ovate, pubescent; petals 2, narrowly obovate; stamens 50 or more, scarcely monadelphous, anthers obovoid; connective much produced, ovate-oblong FEMALE: perianth-segments 5, outer pubescent, inner gradually smaller; ovary shaggy. *Capsule* ½ by 1 in. including the wings, hairy at least until the seeds are scattered, recurved in fruit with a descending wing, dehiscing by four lines one on either side of the two narrow wings. *Seeds* ellipsoid, brown.

31. **B. megaptera,** *A. DC. Prodr.* xv. pt. i. 348; caulescent, glabrous or very nearly so, leaves cordate-ovate acuminate undulate angular hardly serrate. *Kurz in Journ. As. Soc.* 1877, pt. ii. 108. B. malabarica, *Wall. Cat.* 3676 D.

NIPAL; *Wallich.* SIKKIM, alt. 2000–8000 ft., frequent. EAST BENGAL, Patkoye summit, *Griffith.* MARTABAN HILLS; *Kurz.*

Rootstock thick, woody. *Stem* erect, 12–18 in. when well developed. *Leaves* 4–6 in., unequal at the base, nerves beneath and petiole unusually glabrous; petiole 1–4 in.; stipules lanceolate-subulate, glabrous, persistent. *Peduncles* elongate, from the upper axils, often 8 in.; bracts large, oblong, glabrous, caducous; flowers large, not very many, pink. MALE: sepals 2, ovate; petals 2, ovate, little smaller; stamens 50 or more, monadelphous, anthers obovoid; connective produced, obtuse. FEMALE: perianth-segments 5, nearly equal; styles 2, long, combined at the base, with long tortuous branches. *Capsule* and seeds as in *B. rubro-venia.*

32. **B. sikkimensis,** *A. DC. Prodr.* xv. pt. i. 349; caulescent, glabrous or nearly so, leaves round lobed often nearly to the base lobes often again incised or lobed.

SIKKIM, alt. 3000–7000 ft.; *J. D. H.*; *C. B. Clarke.*

Rootstock thickened, woody. *Stem* erect, 12–18 in. when well developed. *Leaves* 4–6 in. diam., not very unequal nor very cordate at the base, denticulate-ciliate; petiole 1–4 in., glabrous; stipules nearly 1 in., lanceolate-linear. *Peduncles* from the upper axils, elongate, often 6–9 in.; bracts elliptic, deciduous, bright-red, as are the pedicels and flowers; flowers medium, not very many. MALE: sepals 2, ovate; petals 2, elliptic, smaller; stamens 50 or more, monadelphous; anthers obovoid; connective produced, triangular, obtuse. FEMALE: perianth-segments 5, inner bright-red gradually smaller; styles 2, combined at the base, branches very tortuous. *Capsule* and seeds as in *B. rubro-venia.*

33. **B. Cathcartii,** *Hook. f. Ill. Him. Pl.* t. 13; caulescent, leaves cordate-ovate acute glabrous beneath except a few paleaceous hairs on the nerves, peduncles and petioles with deflexed paleaceous hairs, ovary pubescent. *A. DC. Prodr.* xv. pt. i. 349. B. nemophila, *Kurz in Journ. As. Soc.* 1877, pt. ii. 108. Begonia sp. *Griff. Notul.* iv. 583 *and Ic.* t. 612.

SIKKIM, alt. 3000–8000 ft.; *J. D. H.*; *C. B. Clarke.* BIRMA; *Griffith* (Kew Distrib. No. 2582); *Kurz.* MOULMEIN; *Parish, Thos. Lobb.*

Near *B. barbata* and best distinguished by the hairs on its stems petioles and peduncles, which are numerous but scattered, long from a lanceolate paleaceous base

and deflexed, by the leaves much less hairy beneath, often quite glabrous; stipules nearly or quite glabrous. *Flowers* fruit and seeds as in *B. barbata.*

34. **B. Thomsonii,** *A. DC. Prodr.* xv. pt. i. 349; caulescent, leaves ovate acuminate hispid beneath denticulate-ciliate not lobed, petioles densely shaggy, bracts cyme and ovary shaggy.

KHASIA MTS., alt. 3000–4000 ft.; *Griffith* (Kew Distrib. No. 2570); *Hk. f. & T.*; *C. B. Clarke.*

This only differs from *B. barbata* by being everywhere more hairy, the petioles are densely shaggy as is the stem.—One example referred here of Griffith's has the stem and petioles covered with a close brown tomentum without any spreading hairs, and appears much more different from *B. Thomsonii* than is *B. Thomsonii* from *B. barbata.*

35. **B. Griffithii,** *Hook. Bot. Mag.* t. 4984; stemless, leaves cordate-ovate acute pubescent beneath hardly ciliate on the margin, peduncle bracts ovary and flowers pubescent. *A. DC. Prodr.* xv. pt. i. 349.

BHOTAN; *Griffith* No. 2505 (Kew Distrib. No. 2571).

Appears to be a variety of *B. barbata* or *B. Thomsonii* with an abbreviated stem. The *capsules* are not ripe but are very like unripe capsules of *B. barbata.* The leaves are much less ciliate barbate on the margin than in *B. barbata.* But for the great authority of Alph. DC., the three *B. barbata, B. Thomsonii* and *B. Griffithii* might be united.

36. **B. Rex,** *Putzeys in Fl. des Serres,* t. 1255, 1256; stemless, leaves cordate-ovate acute pubescent on the nerves beneath, peduncle upwards bracts ovary and flowers glabrous. *Bot. Mag.* t. 5101; *A. DC. Prodr.* xv. pt. i. 350.

ASSAM and MISHMEE; *Griffith* (Kew Distrib. No. 2588, 2589, 2591, 2592); *Masters.*

Leaves 4–6 in., unequal at the base, undulate, ciliate-denticulate, with a few scattered hairs above; petiole 1–4 in. with spreading hairs. *Scapes* 4–9 in., glabrous except a few hairs near the base; flowers medium, rose, not very many. MALE: sepals 2, ovate; petals 2, elliptic; stamens numerous, monadelphous, anthers obovoid; connective produced, acutely triangular. FEMALE: perianth-segments 5, inner gradually smaller; styles 2, combined below, branches very tortuous. *Capsule* $\frac{1}{2}$–$\frac{2}{3}$ by 1–1$\frac{1}{4}$ in. including the wings: much as that of *B. rubro-venia.*—The whole plant is much less hairy than *B. barbata* and the allied species: the capsule is glabrous and its body is less than half the diameter of the pubescent capsules of *B. Griffithii.*

37. **B. brevicaulis,** *A. DC. Prodr.* xv. pt. i. 350; stemless, leaves cordate broad-ovate obtuse or scarcely acute, petioles scape flowers and ovary glabrous or very nearly so.

KHASIA; Terai, alt. 1000 ft.; *H. f. & T.*

Flowers and fruit much smaller than in any of the preceding species of this section. *Rootstock* tuberous. *Leaves* 1–3$\frac{1}{2}$ in., nearly orbicular, not very unequal at the base, crenate-denticulate, hardly ciliate, glabrous or with a few scattered hairs above, rarely with minute pubescence on the nerves beneath; petiole 1–3 in., succulent; stipules oblong, acute, glabrous. *Scape* 3–6 in., sometimes with a small leaf above the base, weak, succulent, with few small flowers; bracts ovate, acute, very small. MALE: sepals 2, round; petals 2, narrower; stamens about 25, shortly monadelphous, anthers oblong; connective much produced, obtuse. FEMALE: not seen. *Capsule* $\frac{1}{4}$ by $\frac{1}{3}$ in., recurved, styles deciduous; two smaller wings very narrow, broader wing descending its upper margin concave very thin; dehiscing by 4 lines one on either side of each of the two narrower wings. *Seeds* short-ellipsoid.—This species resembles in habit many of the sections *Parvibegonia* and *Knesebeckia,* and is very unlike any *Platycentrum* with a produced connective.

** *Connective not produced above the anther-cells.*

38. **B. integrifolia,** *Dalz. in Hook. Kew Journ.* iii. 230; caulescent, leaves ovate-oblong nearly entire ciliate very unequally cordate, petioles succulent laxly pubescent, inflorescence glabrous. *A. DC. Prodr.* xv. pt. i. 351; *Dalz. & Gibs. Bomb. Fl.* 104.

Western Ghauts from BOMBAY to MYSORE; *Law, Dalzell,* &c. MOULMEIN; *Parish.*

Rootstock tuberous. *Stem* 6–12 in., succulent. *Leaves* 3–6 in., hardly acute, pilose above, laxly pubescent on the nerves beneath, finely ciliate; petiole 1–5 in.; stipules lanceolate, upper ones glabrous lower with lax hairs. *Peduncle* as though terminal; flowers white, medium-sized, not very many; bracts broad, ovate, lower with some lax hairs, upper glabrous. MALE: sepals 2, round; petals 2, narrow-oblong; stamens about 50, monadelphous, anthers obovoid. FEMALE: perianth-segments 5, inner gradually smaller; styles 2, combined below, branched and much twisted upwards. *Capsule* $\frac{3}{8}$ by $\frac{5}{8}$–$\frac{3}{4}$ in. including the wings, recurved, smaller wings very narrow, broad wing descending, dehiscing primarily by the narrow face. *Seeds* short-ellipsoid.—Alph. DC. gives Ceylon as a locality, quoting Thwaites No. 2597, which is Thwaites's *B. subpeltata.*

39. **B. guttata,** *Wall. Cat.* 3671 A; caulescent, leaves ovate-oblong nearly entire not ciliate, petioles pubescent, inflorescence glabrous. *A. DC. Prodr.* xv. pt. i. 352.

PINANG; *Wallich.* MALAYA; *Maingay* No. 675 *partly.*

Differs from *B. integrifolia* only in having the leaves nearly without cilia: the flowers appear somewhat smaller, but the two species are probably one. Wallich's specimen is very large with a thick woody rootstock, the petioles 10 in.

40. **B. procridifolia,** *Wall. Cat.* 6292; nearly glabrous, stem erect simple, leaves subsessile oblong acuminate entire or denticulate. *A. DC. Prodr.* xv. pt. i. 352; *Kurz in Journ. As. Soc.* 1877, pt. ii. 108.

MARTABAN; near Tavoy, *Wallich.*

Rootstock fibrous. *Stem* 6–9 in., weak. *Leaves* 3–5 by $\frac{1}{2}$–$1\frac{1}{4}$ in., very unequal at the base, glabrous beneath, sometimes with a few scattered hairs above; petiole $\frac{1}{10}$–$\frac{1}{4}$ in.; stipules $\frac{1}{2}$ in., oblong, acuminate. *Peduncles* from the upper axils, hardly so long as the leaves; bracts ovate, deciduous. MALE: sepals 2, $\frac{1}{8}$ in., round, rose-coloured; petals 2, smaller, narrow-obovate; stamens many, monadelphous, anthers obovoid, connective not produced. FEMALE: not known. *Capsule* more than $\frac{1}{2}$ by $\frac{1}{3}$ in. exclusive of the wings, recurved; styles deciduous; the two narrow wings ovate the broad wing much descending.—This may, in the absence of female flowers, belong to the section *Mezierea,* but the ovate narrow wings of the capsule suggest the present section where it has been placed by Alph. DC.

41. **B. goniotis,** *C. B. Clarke*; nearly glabrous, stem elongate branching, leaves narrow-oblong caudate excessively unequal at base.

BURMA, alt 3700–4000 ft.; *Griffith* (Kew Distrib. No 2579).

Stem 2 ft. *Leaves* 5–6 by $\frac{3}{4}$–1 in., nearly entire or serrate near the apex, one auricle excessively produced backwards often in an angular or quadrate form; petiole $\frac{1}{2}$–$1\frac{1}{2}$ in.; stipules persistent, ovate, acute, mucronate not acuminate, cordate. *Peduncles* axillary, few-flowered, glabrous; bracts deciduous. *Flowers* not seen. *Capsule* $\frac{1}{2}$ by $1\frac{1}{4}$ in. including the wings, glabrous, recurved; styles deciduous; the two narrower wings more than $\frac{1}{4}$ in. broad towards the top of the capsule, the larger descending, dehiscing by 4 lines, one on either side of the narrower wings. *Seeds* short-ellipsoid.—The breadth of the narrower wings of the capsule renders it unlikely that this is a *Mezierea*; but the habit is that of *B. episcopalis,* No. 26.

42. **B. sandalifolia,** *C. B. Clarke*; nearly glabrous, stem elongate, leaves oblong acute very unequal at the cordate base.

BURMA; *Griffith* (Kew Distrib. No. 2585).

Rootstock not much thickened, nor tuberous. *Stem* 15 in., glabrous except the extremities of the branches. *Leaves* 5–6 by 1½–2 in., nearly entire or serrate, pubescent on the nerves beneath, otherwise glabrous; petiole ½–1 in., pubescent; stipules oblong, acute, persistent, glabrous. *Peduncles* near the end of the branches, few-flowered, not elongated; bracts large, elliptic, glabrous; pedicels slightly pubescent. MALE: sepals 2, round, nearly ¾ in. diam., with some pubescence; petals 2, oblong; stamens 50 or more; anthers obovoid, emarginate. FEMALE: not seen. *Capsule* ¾ by 1 in. including the wings, glabrous, recurved; styles deciduous; the two narrower wings ¼ in. broad and nearly an equal breadth for the whole length of the capsule, the broad wing descending, dehiscing by 4 lines one on either side of the two narrower wings.

SECT. V. **Papyraceæ.** *Capsule* 2-celled (3-celled in *B. delicatula*), papyraceous dehiscing by the very thin faces breaking up irregularly, placentas 2-fid.—Small plants with small flowers.

A. *Ovary* 2-celled. *Capsule* winged, the wings not much produced above or below the cells. Sects. *Parvibegonia, Lauchea* and *Monophyllon,* Alph. DC.

43. **B. verticillata,** *Hook. Ic. Pl.* t. 811; radical leaf 0 at the time of flowering, cauline leaves often whorled, bracts ovate marginal with stalked glands. *A. DC. Prodr.* xv. pt. i. 353; *Kurz in Journ. As. Soc.* 1877, pt. ii. 108.

MOULMEIN; *Lobb* No. 382; *Parish.*

Glabrous, or the leaves slightly pilose above. *Rootstock* small, tuberous. *Stem* erect, 2–6 in., whole plant sometimes 1 ft. *Leaves* 1–2 in., 3–8 in a whorl at the summit of the stem, or alternate, oblong-lanceolate, rounded and nearly equal at the base, coarsely crenate-serrate; petiole ⅓–1⅓ in.; stipules minute, lanceolate. *Peduncles* 1–4 axillary, slender, with numerous small white flowers; bracts persistent. MALE: sepals 2, round; petals 2, linear-oblong; stamens about 8, long-monadelphous, anthers oblong, connective not produced. FEMALE: perianth-segments usually 4, inner 2 considerably smaller; styles 2, combined at the base, clavate upwards, branches two short simple curved. *Capsule* less than ¼ by ¼–⅜ in. including the wings, the two smaller wings exceedingly narrow-linear the larger triangular, its upper margin slightly descending. *Seeds* shortly-ellipsoid, minutely papillose on the margins of the reticulations of its surface.

44. **B. prolifera,** *A. DC. Prodr.* xv. pt. i. 353; glabrous, radical leaf 0 at the time of flowering, cauline solitary sessile, peduncles 1–4 axillary. *Kurz in Journ. As. Soc.* 1877, pt. ii. 108. ? B. Finlaysoniana, *Wall. Cat.* 3684.

MOULMEIN; *Lobb* No. 381; on limestone rocks, *Parish.* ? PINANG, *Finlayson.*

Rootstock a tuber. *Stem* ½–4 in. *Leaf* 3–8 in. diam., round-ovate, acute, nearly equally deeply cordate. *Peduncles* 2–10 in., repeatedly dichotomous; bracts hardly ⅛ in., ovate. MALE: sepals 2, broad-elliptic, rose-coloured, sometimes slightly hairy; petals 2, oblong; stamens about 12, much monadelphous, anthers oblong, connective not produced. FEMALE: perianth of 5 much imbricated segments; styles 2, branches two incurved. *Capsule* ⅓ by ½ in. including the wings, recurved; styles deciduous; two smaller wings very narrow above, enlarged and produced below, the upper margin of the larger nearly horizontal from the top of the capsule. *Seeds* globose.—A. DC. describes this plant as stemless, on theoretic grounds, considering that the apparent stem is formed by a complete adhesion of the petiole to the scape, and supporting this view by the statement that there are no stipules at the point whence the peduncles spring. If there were none at that point it would not establish the

above view, but there are two small ovate acute bracts placed at that point.—*B. Finlaysoniana* possibly belongs here: but the example is very imperfect and the leaves are 2–3, some of them petioled.

45. **B. paleacea,** *Kurz in Flora* 1871, 297; cauline leaf 1 obliquely cordate-ovate or orbicular, petioles and inflorescence with short paleaceous hairs, capsule winged below.

MARTABAN; Attaran Valley; *Brandis*.

An erect low herb, simple or nearly so, succulent; rootstock tuberous. *Leaf* 3–6 in., sometimes proliferous, obtuse or obtusely acuminate, entire or deeply crenate, often finely ciliate, membranous, glabrous or sometimes papillose and hairy on the nerves beneath; petiole ½–1 in. or 0; stipules lanceolate, acuminate, pilose. *Cymes* long-peduncled, slender, few-flowered, springing from the base of the ribs of the leaves; pedicels capillary, glandular-pubescent; flowers small, white; bracts of the male flowers ½ in., broad-ovate, obtuse, glabrous, deciduous, the female smaller, lanceolate, acuminate, pilose, more persistent. MALE: sepals ⅛ in., broadly round, slightly hairy without; petals a little smaller; stamens many, monadelphous, anthers obovoid, emarginate. FEMALE: styles 2, connate, shortly 2-lobed. *Capsule* nearly ½ in., glabrous or slightly hairy, oblong, 2-celled, 3-winged; wings ⅛ in. broad, truncate at the apex, or the medial wing twice as broad; placentas 2-fid.—The above copied from Kurz, who has placed the species between *B. prolifera* and *B. sinuata*; the very imperfect specimen communicated seems *B. integrifolia*, No. 38.

46. **B. sinuata,** *Wall. Cat.* 3680; caulescent, leaves cordate-ovate covered on both surfaces by minute but thickly placed stellate hairs, capsule winged below. *A. DC. Prodr.* xv. pt. i. 354; *Kurz in Journ. As. Soc.* 1877, pt. ii. 108. Diplocinium biloculare, *Wight Ic.* t. 1814. B. guttata, elongata, and subrotunda, *Wall. Cat.* 3671 B, 6291, 6293.

PINANG; *Wallich*, &c. TENASSERIM, *Parish*, &c. MALAYA; *Maingay* No. 674.

Rootstock small with small tubers. Whole plant 10 in. but more often quite small, covered (except the upper part of the cymes) with much minute stellate pubescence. *Stem* 1–6 in. *Leaves* 1–5 in. diam., nearly equal at the base, denticulate-sinuate; petiole ½–3 in. or 0; stipules less than ¼ in., lanceolate, acuminate, stellately pubescent. *Cymes* weak; lower bracts lanceolate, stellately hairy; upper often quite glabrous, sometimes lobed; flowers not very numerous, small, pink, glabrous. MALE: sepals 2, roundish; petals 2, narrower, obovate; stamens about 20, much monadelphous, anthers obovoid, connective not produced. FEMALE: perianth-segments 5, inner gradually smaller; styles 2, combined half-way up, stigmas lunate. *Capsule* ¼ by ⅜ in. including the wings; wings from the lower part of the capsule, two smaller triangular acute. *Seeds* short-ellipsoid, somewhat obovoid.

47. **B. andamensis,** *Parish ms.*; caulescent, nearly glabrous, leaves cordate-orbicular shortly petioled or the upper sessile; capsule winged below.

ANDAMANS and MOULMEIN; *Parish*.

Rootstock tuberous. *Stem* erect, whole plant 6–10 in. *Leaves* 1–4 in. diam., entire or minutely closely denticulate, equal at the base, with few lax hairs on the nerves beneath, sometimes minutely pilose above; petiole of the radical leaves elongate, of the cauline usually 0–¾ in.; stipules small, ovate, acute, glabrous. *Peduncles* very glabrous upwards; bracts very small, ovate, acute; flowers not very many, rose-coloured, rather larger than in the allied species. *Flowers capsule* and *seeds* almost identical with those of *B. sinuata* but the styles are less combined.—The capsule is quite membranous but shows a tendency to dehisce along either side of the narrow wings, exactly as in *Platycentrum*: and the present species (with *B. sinuata*) seems closely allied to the small species of that section. This species is reduced to *B. sinuata* by Kurz, but it does not exhibit the stellate hairs on the upper surface of the leaf and the flowers are much larger.

48. **B. martabanica,** *A. DC. Prodr.* xv. pt. i. 354; caulescent, leaves petioled cordate-ovate, petioles and nerves of the leaves beneath pubescent. *Kurz in Journ. As. Soc.* 1877, pt. ii. 108.

MOULMEIN; *Lobb* No. 393; *Helfer* (Kew Distrib. No. 2575).

This differs from *B. sinuata* by the absence of the stellate pubescence: and from *B. andamensis* in the leaves being longer-petioled, none sessile, more acute with a serrate ciliate margin; and in the generally greater pubescence; the stipules being pubescent and the lower bracts often ciliate or fimbriate.

49. **B. Parishii,** *C. B. Clarke*; cauline leaves 1–3 all sessile cordate orbicular with lax scattered pubescence above and on the nerves beneath, capsule winged above.

MOULMEIN; on limestone rocks; *Parish.*

Tuber rather large. Erect, nearly 1 ft., stem and lower part of the peduncle with some lax pubescence. *Leaves* 1½–3½ in. diam., subequal at the base, crenate-serrate; petiole of the cauline 0, of the radical 2–8 in.; stipules of the cauline ⅙ in., ovate, acute, ciliate. *Pedicels* and flowers glabrous; lower bracts ⅙ in., ciliate or fimbriate, ovate, acute. *Flowers* few, medium, rose-coloured. MALE: sepals 2, ⅓ in., round; petals 2, obovate, narrower, rather shorter; stamens about 40, long-monadelphous, anthers elongate-obovoid, connective not at all produced. FEMALE: perianth of 4 (perhaps of 5) segments; styles 2, long combined, stigmas curved complex. *Capsule* (only half ripe) more than ¼ in.—The ripe capsule not being seen, this species may be a *Platycentrum*, as the size of the flowers indicates, but the styles are combined nearly to the base of the stigmas.

50. **B. flaccidissima,** *Kurz in Journ. As. Soc.* 1872, pt. ii. 308; caulescent, minutely sparsely pubescent, leaves petioled cordate orbicular obtuse, petals in the male 0.

TENASSERIM; *Kurz.*

A tender very flaccid herb, 4–5 in. high. *Leaves* 2 in. diam., deeply crenate-dentate, almost lobed; petiole 2–3 in.; stipules hyaline, obtuse, about ⅙ in. *Cymes* dichotomous, minutely sparsely pubescent; bracts linear, minute; flowers small, white, on capillary pedicels. MALE: sepals 2, ⅙–¼ in., rotund-ovate; petals 0; stamens many, very monadelphous, anthers subovoid. FEMALE: perianth-segments 4; styles 2, free from the base, each dilated into a concave semilunate stigma; ovary sparsely and crisply pilose, 2-celled. *Capsule* unknown.—Plant not seen. The above copied from Mr. Kurz. The general description is like that of *B. delicatula*, No. 54.

B. *Ovary* 2-celled. *Capsule* winged, wings irregular and much produced below the cells. *Perianth* accrescent on the fruit. Sect. *Dysmorphia*, A. DC.

51. **B. crenata,** *Dryand. in Trans. Linn. Soc.* i. 162, t. 14, fig. 3; pedicels and young ovary often with minute scattered glandular pubescence, sepals of the male ¼–⅓ in. *A. DC. Prodr.* xv. pt. i. 356; *Dalz. & Gibs. Bomb. Fl.* 104. B. minima, *Bedd. Ic. Pl.* t. 110.

MALABAR coast, alt. 0–3000 ft., from BOMBAY to WYNAAD. ? TENASSERIM, *Helfer*, No. 2584.

Nearly glabrous. *Rootstock* slender, tuberous. *Stem* slender, 4–10 in., 1–4-leaved. *Leaves* 1½–2 in. (sometimes much smaller), ovate, slightly cordate at the base, crenate or serrate, glabrous or with slight pubescence on the nerves beneath; petiole ½–2 in.; stipules small, ovate, acute, glabrous. *Peduncles* weak; bracts less than ⅙ in., ovate, acute, glabrous; flowers not numerous, white or pinkish. MALE: sepals 2, elliptic; petals 2, narrower; stamens 8–16, very monadelphous, anthers oblong, connective not produced. FEMALE: perianth-segments 5, outer elliptic, inner oblong, soon becoming larger than the male flower; styles 2, combined at base,

stigmas lunate. *Capsule* scarcely $\frac{1}{4}$ by $\frac{1}{8}$ in., membranous, crowned by the accrescent perianth. *Seeds* short-ellipsoid.—Col. Beddome's *B. minima* is reduced by inspection of his figure merely. Helfer's No. 2584 is in fruit and is either this or some very closely allied species.

52. **B. canarana,** *Miq. Anal. Bot. Ind.* iii. p. 18; pedicels and ovary glabrous, sepals of the male $\frac{1}{8}$ in. *A. DC. Prodr.* xv. pt. i. 356. B. rubella, *Miq. in Pl. Hohenack.* No. 843, *not of Ham.*

MANGALOR, in Canara; *Hohenacker.*
Closely resembling the preceding species: but the leaves flower and fruit are rather smaller. The styles in *B. canarana* are combined higher up (ex A. DC.).

C. *Ovary* 3-celled. *Capsule* membranous, globose, wingless.

53. **B. delicatula,** *Parish ms*; styles long combined.

MOULMEIN; *Parish.*
Rootstock small, fibrous. *Stem* 5–12 in., slightly dividing, with several leaves and peduncles from all the axils, glabrous, weak. *Leaves* 2–3 in. diam., broad-orbicular, cordate, subequal at the base, doubly serrate, very delicate, with weak scattered pubescence above and on the nerves beneath; petiole of the cauline leaves long, attaining 3–4 in.; stipules less than $\frac{1}{4}$ in., lanceolate, glabrous. *Peduncles* repeatedly dichotomous, with very many flowers; bracts numerous, small, hyaline, subpersistent, oblong, ciliate or fimbriate, pedicels and young ovary with minute sparse lax pubescence. MALE: sepals 2, $\frac{1}{4}$ in., round; petals 0; stamens 20, much monadelphous, anthers narrow-obovoid, connective not produced. FEMALE: perianth of 4 segments, inner two obovate, not very narrow; styles 3, stigmas lunate. *Capsule* $\frac{1}{8}$ in. diam., almost exactly globose, very membranous, breaking up irregularly, wingless. *Seeds* shortly ellipsoid.

SECT. VI. **Uniplacentales.** *Placentæ* undivided. *Capsule* 3-celled with 3 thin not very unequal wings, dehiscing by lines within the margins of its three faces.

* *Stemless, or stemmed having the peduncles long and from the upper axils only.*

54. **B. fibrosa,** *C. B. Clarke*; cauline leaves 2 orbicular sessile with many peduncles from the axils of each.

MOULMEIN; on limestone rocks; *Parish.*
Rootstock fibrous, no root-leaves in the dried examples; plant 6–10 in., glabrous or nearly so. *Leaves* orbicular, larger 6–8 in. diam., nearly entire. *Peduncles* rather stout, as many as 7 from one axil, minutely sparsely puberulo-pubescent; bracts foliaceous; lower $\frac{3}{4}$ in., elliptic, glabrous, often petioled; upper smaller. MALE: sepals 2, $\frac{1}{4}$ in., ovate; petals 2, oblong, smaller; stamens about 10, nearly free, anthers short-obovoid, connective not produced. FEMALE: perianth of 3 segments; styles 3, combined less than half their length, each dividing into two curved branches. *Capsule* $\frac{3}{8}$ by $\frac{1}{2}$ in. including the wings, upper margin of the broader wing horizontal or somewhat descending. *Seeds* small, ellipsoid.

55. **B. tenera,** *Dryand. in Trans. Linn. Soc.* i. 169, t. 16; stemless, leaves ovate, petioles peduncles and young ovary with much lax pubescence. *A. DC. Prodr.* xv. pt. i. 386. B. Thwaitesii, *Hook Bot. Mag.* 4692; *A. DC. l. c.*

CEYLON, *Walker.* Pas-dom Corle; *Thwaites.*
Rootstock somewhat thick, tuberous. *Leaves* 2–4 in. diam., obtuse or subacute,

subequally cordate at the base, minutely denticulate not serrate, with scattered weak pubescence on both surfaces, the young leaves very shaggy; petiole 2–5 in.; stipules nearly ½ in., ovate, acute, glabrous. *Peduncles* 3–6 in., not exceeding the leaves, with a few flowers towards their summits; bracts ovate, acute, ciliate, pubescent or the lower ones glabrous. MALE: sepals 2, ¼–⅜ in., round, pubescent on the back; petals 2, oblong; stamens about 40, anthers obovoid, connective not produced. FEMALE: perianth of 5 segments, inner narrower; styles 3, nearly free, 2-lobed near their summit. *Capsule* ⅜ by ½ in. including the wings, wings not very unequal, their upper margins straight from the top of the capsule slightly descending. *Seeds* short-ellipsoid.—The example of Walker marked *B. tenera, Dryand.* in the writing of M. Alph. DC. is identical with Thwaites' No. 2808.

56. **B. subpeltata,** *Wight Ic.* t. 1812; stemless, leaves ovate, petioles pubescent, pedicels and young ovary glabrous. *A. DC. Prodr.* xv. pt. i. 386.

SOUTH DECCAN PENINSULA; probably Malabar or Travancore, *Wight.* CEYLON, *Thwaites.*

This differs from *B. tenera, Dryand.* in the glabrous pedicels and ovaries, in the larger flowers, in the somewhat angular leaves which are slightly more serrate. (See *Thwaites Enum.* p. 128.) It is hardly distinct from *B. tenera.*

57. **B. concanensis,** *A. DC. Prodr.* xv. pt. i. 314; caulescent, glabrous or nearly so, leaves ovate serrate and sometimes lobed. *Dalz. & Gibs. Bomb. Fl.* 104.

CONCAN, tropical region, *Stocks.* BOMBAY, above the Ghats, *Law.*

Rootstock a tuber. *Stem* elongated, whole plant sometime 1 ft. *Leaves* 3–5 in., acute not acuminate, cordate, subequal at the base, young leaves with a little lax pubescence beneath, the older leaves with a few scattered hairs or quite glabrous; petiole of the cauline leaves 1–2½ in., of the radical often very long; stipules ⅛ in., ovate, acute. *Peduncles* elongate, dichotomous; bracts lanceolate; flowers rose-coloured, not very many. MALE: sepals 2, nearly ½ in., elliptic; petals 2, smaller, narrower; stamens about 40, nearly free, anthers obovoid, connective not produced. FEMALE; perianth of 5 segments, 3 inner much narrower; styles 3, nearly free, bifid near the apex. *Capsule* ½–⅝ by ⅝–¾ in. including the wings, wings from the upper part of the capsule, their upper margins slightly descending. *Seeds* ellipsoid.—This slightly differs from *subpeltata* by having a distinct (often elongate) stem and the petioles without patent hairs. As to the placentas which are taken as bipartite by Alph. DC., but are at least sometimes undivided, it is curious that the example of *B. concanensis* at Kew authenticated in A. DC.'s handwriting is typical *B. trichocarpa.*

58. **B. trichocarpa,** *Dalz. in Hook. Kew Journ. Bot.* ii. 230; caulescent, leaves ovate serrate, flowers large, ovary with much lax pubescence. *A. DC. Prodr.* xv. pt. i. 350; *Dalz. & Gibs. Bomb. Fl.* 104.

MALABAR GHATS; CONCAN, CANARA, MYSORE, MALABAR, frequently collected.

Rootstock large, tuberous. *Stem* elongate, often exceeding 1 ft., glabrous or nearly so. *Leaves* 3–5 in., acute scarcely acuminate, cordate, subequal at the base, with scattered pubescence on both surfaces; petiole of the cauline leaves often 3–4 in., little pubescent; stipules ½ in., ovate, lanceolate. *Peduncles* scarcely elongate, repeatedly dichotomous; bracts ⅜ in., lanceolate, ciliate, pubescent; pedicels and ovary with lax long hairs; flowers white. MALE: sepals 2, elliptic, sometimes exceeding ¾ in., more or less pubescent without, usually entire, sometimes fimbriate or ciliate; petals 2, narrower, shorter; stamens 40 or more, nearly free, anthers oblong-obovoid, connective not produced. FEMALE: perianth of 5 segments, inner narrower; styles 3, nearly free, each divided into two branches. *Capsule* ½–⅝ by nearly 1 in. including the wings, ultimately glabrous, wings not much unequal, their upper margins from the summit of the capsule slightly ascending; placentas undivided.

59. **B. nivea,** *Parish ms.*; *Kurz in Journ. As. Soc.* 1873, pt. ii. 81; radical leaf solitary elliptic-oblong doubly serrate, petiole 0–½ in., scape leafless or with two very small leaves near its base.

MOULMEIN; *Parish.*
Rootstock tuberous. Radical *leaf* 2–3½ in., obtuse, subequal scarcely cordate at the base, glabrous, white beneath, with scattered very coarse bristles above. *Scape* 6–8 in., glabrous, leafless, or with a pair of opposite leaves near its base which resemble the radical leaf but are less than 1 in., divided near the summit; bracts ovate or oblong, very obtuse, entire, glabrous; flowers medium-large, white. MALE: sepals 2, ⅜–½ in., round; petals 2, not much shorter but narrow; stamens about 10, much monadelphous, anthers oblong, connective not produced. FEMALE: perianth of 5 (or 6) segments; styles 3, much combined, each ending in two curved branches. *Capsule* ⅓ by ½–⅝ in. including the wings, wings not very unequal, their upper margins horizontal.

60. **B. albo-coccinea,** *Hook. Bot. Mag.* t. 4172; stemless, leaves broadly round peltate entire. *A. DC. Prodr.* xv. pt. i. 389. B. Grahamiana, *Wight Ic.* t. 1811. B. Wightiana, *Wall. Cat.* 3673.

COURTALLUM; *Wight.* MYSORE and CARNATIC, alt. 1000 ft.; *G. Thomson.*
Rootstock elongate, thick. *Leaves* 3–4½ in., usually broader than long, nearly glabrous when mature but often ciliate on the margin; petiole 3–6 in., pubescent often tomentose; stipules large, sometimes exceeding 1½ in., lanceolate, glabrous. *Scapes* 4–9 in., usually glabrous below, above with the bracts and pedicels pubescent; bracts ¼ in., lanceolate; flowers many, bright rose-coloured. MALE: sepals 2, ⅜ in., round; petals 2, elliptic; stamens 40, very shortly monadelphous, anthers shortly obovoid, connective not produced. FEMALE: young ovary almost tomentose; styles 3, little combined below, 2-lobed and much contorted above. *Capsule* ⅞ by ⅝ in. including the wings; wings equal, continued at nearly equal breadth entirely round the capsule which is thus exactly elliptic in outline. *Seeds* ellipsoid.

61. **B. floccifera,** *Bedd. Ic. Pl. Ind. Or.* 111; scape elongate far above the leaves many-flowered, leaves broadly rounded with whitish tomentum beneath.

TRAVANCORE and SOUTH TINNEVELLY HILLS, alt. 3000 ft.; *Beddome.*
Leaves 1½–3 in., broader than long, subequally cordate at the base, denticulate or nearly entire, thickly coriaceous, with close whitish or yellowish tomentum on both surfaces, becoming at length nearly glabrous above; petiole 1–3 in., with similar tomentum; stipules ¾ in., broad-elliptic, acute, scarious. *Scape* 18 in., very firm, branching at 15 in. high into a very compound cyme; bracts many, small, lanceolate, glabrous, persistent; pedicels and flowers glabrous. MALE: sepals 2, scarcely ¼ in., round; petals 0; stamens 40, shortly monadelphous, anthers obovoid, connective not produced. FEMALE: perianth of 4 nearly equal segments, persistent on the fruit; styles 3, nearly free, 2-lobed near the apex. *Capsule* ½ by ⅝ in. including the wings; wings subequal, rounded, broadest at the height of half the capsule. *Seeds* ellipsoid.

62. **B. Brandisiana,** *Kurz in Flora* 1871, 295; radical leaves long-petioled deeply 5–7-lobed, cauline small, perianth both of male and female of 2 segments.

MARTABAN; Attaran Valley; *Dr. Brandis.*
Rootstock tuberous; stem succulent, nearly glabrous and simple. Radical *leaves* 5–7 in., rather broader than long, membranous, base subcordate, lobes acuminate and obtusely repand-toothed; petiole 5–8 in., glabrous; cauline leaves much smaller and shorter-petioled, usually 5-lobed. *Peduncle* very long, subradical, many times dichotomous; pedicels capillary; bracts lanceolate, minute; flowers very many, white,

minute. *Sepals* of either sex 2, $\frac{1}{10}$ in., round, emarginate, a little broader than long; petals of either sex 0; *stamens* many, free, anthers oblong. *Styles* 3, bifid at the apex. *Capsule* $\frac{1}{4}$–$\frac{1}{3}$ in., ovate, acute, glabrous, 3-winged; wings retrorsely produced below the cells, 2 broad-oblong obtuse, the other linear-oblong; placentas undivided. *Seeds* small, short, ellipsoid.

** *Stem elongate with lateral inflorescence.*

† *Perianth of the male flower of 4 segments.*

63. **B. Wallichiana,** *A. DC. Prodr.* xv. pt. i. 383; young parts pedicels and ovary with short viscid pubescence.

Morung Mountains; *Hamilton* ex Wall. Cat.

Branch more than 10 in. long, dividing repeatedly, with many leaves, and flowers from the lowermost as well as the upper axils. *Leaves* 2–3 in., cordate, ovate, very unequal at the base, dentate-serrate, with very short viscid pubescence on both surfaces; petiole $\frac{1}{4}$–1 in., viscidly pubescent; stipules $\frac{1}{6}$ in., ovate, acute, ciliate. *Peduncles* 2 in., few-flowered; bracts $\frac{1}{8}$ in., ovate, acute, scarious, pubescent, persistent. Male: sepals 2, $\frac{1}{4}$ in., round-elliptic; petals 2, narrower; stamens (ex A. DC.) monadelphous, anthers ovoid, connective not produced. Female: styles 3, free, each ending in two long curved and twisted branches. *Capsule* $\frac{3}{4}$ by $\frac{5}{8}$ in. including the wings, at length glabrous, wings subequal, broadest near the base of the capsule, their margin everywhere rounded. *Seeds* ellipsoid.—The locality of this plant is very doubtful. By *Morung* Hamilton understood the Terai from the river Teesta to the Kooshee (see Hamilton's Nepal p. 151): this tract has been explored by very good collectors (J. Scott, Gamble, &c.) since, and no plant at all corresponding to the present large species has been obtained: indeed Alph. DC. doubts (and with reason) whether any such plant has ever been found in Asia.

†† *Perianth of the male flower of 2 segments only.*

64. **B. malabarica,** *Lamk. Dict.* i. 393, *not of Roxb.*; flowers medium large, capsule more than $\frac{1}{2}$ in.. *Wall. Cat.* 3676, *excl.* D; *A. DC. Prodr.* xv. pt. i. 392; *Thwaites Enum.* 128 (β) *only.* B. dipetala, *Grah. in Bot. Mag.* t. 2849; *Lodd. Bot. Cab.* t. 1730; *Lindl. & Paxt. Flow. Gard.* i. t. 14; *Wight Ic.* t. 1813; *A. DC. l. c.* 391. B. tuberosa, *Herb. Mad.*; *Wall. Cat.* 3675. B. hydrophila, *Miq. in Flora* 1853, 769; *A. DC. l. c.* 392.

Malabar Mts.; common, ascending to 6000 ft.; and in Ceylon.

Stem often 2 ft., repeatedly dividing, with many leaves. *Leaves* 2–4 in., cordate, acute, very unequal at the base, crenate or serrate, pilose above and sometimes pubescent beneath, or altogether glabrous; petiole 1–5 in.; stipules $\frac{3}{8}$ in., persistent, ovate, acute, glabrous. *Peduncles* axillary, rarely exceeding 2–3 in., glabrous or nearly so; bracts $\frac{3}{8}$ in., lanceolate, acute; flowers rose-coloured, not very many on one peduncle. Male: sepals 2, $\frac{5}{8}$–$\frac{1}{2}$ in., round, glabrous; petals 0; stamens 40, shortly monadelphous, anthers obovoid, connective not produced. Female: perianth nearly as in the male; styles 3, little combined at the base, each dividing into two curved and twisted branches. *Capsule* $\frac{3}{4}$ by $\frac{3}{4}$ in. including the wings; wings little unequal, continued all round the capsule, rounded altogether or having an obtuse angle at the outer upper margin. *Seeds* ellipsoid, slightly obovoid.—The following are distinguished as species by Alph. DC.

Var. 1. *dipetala*; leaves pilose above and sometimes pubescent beneath, capsule without any angle on the wings.—This is the old *B. tuberosa* of the Madras Herbarium and *B. dipetala vera* of Thwaites. But there are examples at Kew in ripe fruit which have most of the capsules round-winged, others on the same stem angularly winged; and in the large series of examples the pubescence is often evanescent or all but so.

Var. 2. *hydrophila*; leaves pilose above, capsule shorter than in var. 1, the wings broader and more unequal.

VAR. 3. *malabarica*; leaves glabrous, capsules large slightly subquadral rather than elliptic.—As to *Rheede Hort. Mal.* ix. t. 86 referred here, it may be the present plant as it is difficult to guess what other species Rheede could have got in Malabar: though it differs not merely in the points mentioned by Alph. DC.; but in the male flowers with two sepals and two petals.

DOUBTFUL AND EXCLUDED SPECIES.

65. B. KHASIANA, *C. B. Clarke*; flowers minute, capsule less than ¼ in. B. pedunculosa *Wall. Cat.* 3672 B.

SYLHET MTS. (which means Khasia); *Wallich.*

Branches weak, succulent, scariose winged, repeatedly divided with many leaves. *Leaves* 1½–2 in., cordate, acute, very unequal at the base, serrate, pilose above, laxly sparsely villose on the nerves beneath; petiole ¼–¾ in.; stipules ¼ in., persistent, oblong, acute, glabrous. *Peduncles* from the lower as well as from the upper axils, 1–1½ in., few-flowered; bracts minute, elliptic, acute, ciliate, fimbriate. MALE: sepals 2, scarcely ⅛ in., round, glabrous; petals 0; stamens about 8, anthers oblong, connective not produced. FEMALE: perianth of 5 segments; styles 3, divided upwards. *Capsule* ⅛ by ¼ in. including the wings; wings 3, one about twice as broad as the others, its margin from the top of the capsule first horizontal then rounding away without angles; capsule dehiscing by marginal lines within the margins of its faces; placentas not seen.

B. TENUIFOLIA, *Dryand. in Trans. Linn. Soc.* i. 162, from Pulo Pontangh, is not a Pulo Pinang plant as A. DC. suspects from the similarity of the names (see *Prodr.* xv. pt. i. 351).

ORDER LXVII. **DATISCACEÆ.** (By C. B. Clarke.)

Trees or herbs. *Leaves* petioled, simple or pinnate; stipules 0. *Flowers* small, diœcious in the Indian species, clustered racemed or panicled. MALE: calyx-tube short, teeth 3–9; petals 0; stamens 4–25. FEMALE: calyx-tube adnate to the ovary, lobes 3–8 short; petals 0; ovary 1-celled, open or closed at the vertex; styles lateral, alternating with as many parietal placentæ, simple or 2-partite; ovules very many, ascending or horizontal. *Capsule* coriaceous or membranous, opening at the vertex between the styles. *Seeds* very many, small, albuminous; embryo straight, radicle next the hilum.—DISTRIB. Species 4; natives of the Mediterranean, Central Asia, Java, and North-West America.

Herb. Styles 3, deeply divided. Lower leaves pinnate . . . . . 1. DATISCA.
Tree. Styles 4, simp e. Leaves all simple . . . . 2. TETRAMELES.

1. **DATISCA,** *Linn.*

Tall glabrous erect herbs. *Leaves* 3-partite or unequally pinnate, the uppermost undivided; leaflets lanceolate, strongly serrate. *Flowers* diœcious, axillary, clustered, short-pedicelled. MALE: Calyx-tube very short, lobes 4–9, unequal; stamens 9–25; no rudiment of the ovary. FEMALE: Calyx-tube ovoid, trigonous upwards; styles 3, divided nearly to the base into two linear stigmas. *Capsule* narrow-oblong, trigonous, coriaceous, opening at the vertex between the styles. *Seeds* many, ellipsoid, coarsely reticulated.—DISTRIB. Species 2, one in Western Asia, the other in California.

1. **D. cannabina,** *Linn.*; *Boiss. Fl. Orient.* ii. 763; leaves from the flowering branches long-petioled very narrowly linear-lanceolate attenuated at

both ends, flowers fascicled, rarely on short lateral branches and falsely racemed. *Lamk. Ill.* t. 823; *Wall. Cat.* 4664; *A. DC. Prodr.* xv. pt. i. 410; *Sibth. Fl. Græc.* t. 960. D. nepalensis, *Don Prodr.* 203.

Temperate and Subtropical Western Himalaya from KASHMIR to NIPAL, alt. 1000–6000 ft.; *Wallich, Thomson*, &c., not very common.—DISTRIB. Westward to the Levant.

Stem 2–6 ft., stout, branching. Lower *leaves* 1 ft., pinnate; leaflets 7–11, 6 by 1½ in., petioluled; upper much smaller and less divided; floral simple, 3 by 1¼ in. *Pedicels* often carrying linear bracts. *Anthers* oblong, rather large; filaments very short. *Styles* ¼ in. *Capsule* ⅓ by less than ⅛ in.

2. **TETRAMELES,** *R. Br.*

A large tree. *Leaves* petioled, ovate, pubescent beneath at least on the nerves. *Flowers* diœcious, appearing before the leaves; males panicled, females in elongate racemes, clustered near the ends of the branchlets. MALE: Calyx-lobes short; teeth 4, ovate, one or two smaller teeth sometimes added; petals 0; stamens 4, opposite the calyx-teeth, inserted round a depressed disc; rudiment of the ovary 0 or quadrangular. FEMALE: Calyx-tube ovoid; teeth 4, short; petals 0; styles 4, short, stigmas simple somewhat club-shaped. *Capsule* ovoid, with 4 lines or slight ridges, membranous, opening at the top between the styles. *Seeds* very many, minute, flattened, ellipsoid, testa very lax and extending much beyond the nucleus as a loose ragged large-reticulated membrane.

1. **T. nudiflora,** *R. Br. in Benn. Pl. Jav. Rar.* 79, t. 17; *A. DC. Prodr.* xv. pt. i. 411; *Bedd. Fl. Sylv.* t. 212; *Brand. For. Fl.* 245; *Kurz For. Fl.* 535. T. Grahamiana, *Wight Ic.* t. 1956; *A. DC. l. c.* T. rufinervis, *Miq. Fl. Ind. Bat.* i. pt. i. 726; *A. DC. l. c.* Anictoclea Grahamiana, *Nimmo in Grah. Cat. Bomb. Pl.* 252.—Indeterminata, *Wall. Cat.* 9045.

SIKKIM, alt. 2000 ft.; *J. D. H.* WESTERN GHATS from BOMBAY to CEYLON. BURMA, TENASSERIM and ANDAMANS, frequent, *Kurz.*—DISTRIB. Java.

Attains 100–150 ft. *Leaves* 5–6 by 4–5 in. roundly ovate, shortly acuminate, serrate or nearly entire, pubescent on both surfaces when young, glabrescent when old, glabrous in Mr. Kurz's Andaman plant except the nerves beneath. *Racemes* and *panicles* pubescent; flowers sessile or nearly so, bracts minute or 0. *Anthers* small, roundish; filaments long. *Capsule* ⅕ by ⅛ in., glandular.

ORDER LXVIII. **CACTEÆ.** (By C. B. Clarke.)

Herbs, shrubs, or trees; branches often thickened, striated, or angled. *Leaves* usually represented by tufts of spines, or by prickles or small tubercles. *Flowers* solitary, sessile, hermaphrodite, regular. *Calyx-tube* adnate to the ovary, lobes 3–∞, small, imbricate. *Petals* ∞, free or shortly united at the base, imbricate. *Stamens* ∞, free or adnate to the base of the petals; filaments filiform. *Ovary* 1-celled; style filiform or cylindric, stigma 2–∞ rayed; ovules very many on parietal placentas, horizontal. *Berry* 1-celled, placentas pulpy. *Seeds* very many, oblong or reniform; albumen plentiful, or scanty, or almost 0; embryo straight or curved.—DISTRIB. Species 1000, confined to America, except *Rhipsalis cassytha.*

OPUNTIA DILLENII, *Haw.; DC. Prodr.* iii. 472; Cactus indicus, *Roxb. Hort. Beng.* 37, *Fl. Ind.* ii. 475; *Wight Ill.* 114; an American plant, is naturalised in India, and

is nearly or quite the same species as that on which cochineal is tended in Teneriffe; see *Lowe Fl. Madeira*, 313–319; *Brand. For. Fl.* 245–247. Roxburgh states that the cochineal "insects" brought from America throve and multiplied abundantly on his *Cactus indicus*.

1. **RHIPSALIS,** *Gaertn.*

Small fleshy shrubs; branches long, terete, or flattened and leaf-like. *Leaves* represented by small scales. *Flowers* lateral, small. *Calyx-tube* not produced above the ovary, lobes 3–∞. *Petals* 6–10, spreading, oblong. *Ovary* smooth; style filiform, stigma 3–∞-rayed. *Berry* globose, smooth; the placentas projecting inwards nearly to the axis. *Seeds* obovoid; albumen 0.—Distrib. Species 30, confined to Tropical America, except the one species below.

1. **R. Cassytha,** *Gaertn. Fruct.* 137, t. 28. fig. 1; branches round pendulous whorled, petals 5–6. *DC. Prodr.* iii. 476; *Lodd. Bot. Cab.* t. 865; *Hook. Exot. Fl.* t. 2; *Bot. Mag.* t. 3080; *Thwaites Enum.* 129.

Ceylon; upon rocks and trees throughout the Central Province and certainly indigenous, *Walker*; *Thwaites.*—Distrib. Mauritius, South and Central Africa, Tropical America.

Calyx-segments 4–5, acute, very unequal, tinged with red at the apex. *Corolla* white. *Stamens* about 20. *Placentas* 3–4; stigma 3–4-rayed. *Berry* size of a pea, transparent, white. *Seeds* oblong, shining, black, obscurely striate.

Order LXIX. **FICOIDEÆ.** (By C. B. Clarke.)

Herbs. *Leaves* simple, often fleshy, usually opposite or whorled; stipules 0 or scarious. *Flowers* usually in cymes or clusters, rarely solitary, regular, hermaphrodite rarely polygamous. *Calyx* of 4–5 segments, united into a tube or nearly distinct, free from the ovary in the Indian genera, often persistent. *Petals* usually wanting, when present small. *Stamens* perigynous or hypogynous, definite or indefinite; staminodes sometimes present. *Ovary* free (except in *Mesembryanthemum*), 2–5-celled, syncarpous (except in *Gisekia*); styles as many as the carpels; ovules many in each carpel and axile, or solitary basal. *Fruit* usually capsular, splitting dorsally or circumsciss, more rarely the carpels separate into cocci. *Seeds* many or 1 in each carpel, usually reniform, compressed; embryo curved or annular, surrounding the farinaceous albumen, radicle next the hilum.—Distrib. Species 450, chiefly African, a few are scattered through most tropical and subtropical regions.

Tribe I. **Aizoideæ.** *Calyx-tube* elongate. *Stamens* inserted on the calyx-tube.

* *Carpels dehiscing dorsally.*

Hairy woody small herbs . . . . 1. Aizoon.

** *Capsule circumsciss.*

Ovary (and capsule) 3–5-celled . . . . 2. Sesuvium.
Ovary (and capsule) 1–2-celled . . . . 3. Trianthema.

TRIBE II. **Mollugineæ.** *Calyx* deeply 5-partite. *Stamens* hypogynous.

† *Carpels dehiscing dorsally.*

Petals many, small, hypogynous . . . . 4. ORYGIA.
Petals 0. Stipules scarious, fugacious . . . . 5. MOLLUGO.

** *Capsule of separate cocci.*

Carpels 3–5, separate in the flower . . . . 6. GISEKIA.
Carpels 2, combined in the flower . . . . 7. LIMEUM.

1. AIZOON, *Linn.*

Spreading procumbent herbs, or small shrubs. *Leaves* alternate or falsely opposite, entire; stipules 0. *Flowers* axillary, solitary or in spikes or cymes. *Calyx-tube* short; lobes 5–4, spreading, yellow within. *Petals* 0. *Stamens* many, inserted near the top of the calyx-tube. *Ovary* free, 5–4-celled, depressed, nearly included in the calyx-tube; styles 5–4, free, subulate; ovules several in each cell. *Capsule* almost woody, surrounded by the persistent calyx, 5-celled, cells splitting from the top downwards dorsally. *Seeds* 2 or several in each cell, reniform; embryo annular.—DISTRIB. Species 8, from Europe to S. Africa, and from the Canaries to Scinde: one aberrant species in Australia.

1. **A. canariense,** *Linn.*; *Boiss. Fl. Orient.* ii. 765; leaves petioled hairy elliptic, capsules sessile numerous, the valves inflexed. *DC. Pl. Grass.* t. 136, *Prodr.* iii. 453.

SCINDE; *Stocks, Vicary.*—DISTRIB. Affghanistan, Arabia, Africa.

Small, woody, closely procumbent, repeatedly dividing. *Leaves* 1–1½ in., papillose and simply hairy or tomentose, petiole 0–¼ in. *Flowers* in nearly every axil. *Calyx-lobes* ⅜ in. ovate. *Capsule* ⅜ in. broad, the summit when looked down upon pentagonal. *Seeds* black, smooth, with a few continuous raised ridges concentric with regard to the unappendaged hilum.

2. SESUVIUM, *Linn.*

Succulent branching herbs. *Leaves* opposite, fleshy; stipules 0. *Flowers* axillary, sessile or peduncled, solitary, rarely in cymes. *Calyx-tube* short; lobes 5, triangular-lanceolate, persistent, often coloured. *Petals* 0. *Stamens* many or 5, inserted round the summit of the calyx-tube. *Ovary* free, 3–5-celled; styles 3–5; ovules many, axile. *Capsule* ovate-oblong, membranous, 3–5-celled, circumsciss. *Seeds* many in each cell, reniform; embryo annular.—DISTRIB. Species 4, littoral in warm climates.

1. **S. Portulacastrum,** *Linn.*; *Roxb. Fl. Ind.* ii. 509; glabrous, styles 3–5, seeds black shining smooth. *Dalz. & Gibs. Bomb. Fl.* 15; *Kurz in Journ. As. Soc.* 1877, pt. ii. 110. S. repens, *Willd.*; *DC. Prodr.* iii. 453; *Wall. Cat.* 6836; *W. & A. Prodr.* 361; *Wight in. Hook. Comp. Bot. Mag.* ii. 71, t. 23. Psammanthe marina, *Hance in Walp. Ann.* ii. 660.

Seashores of INDIA, from BOMBAY to CALCUTTA and SINGAPORE.—DISTRIB. Tropical and subtropical seashores.

Small, or extensively creeping and rooting in sand. *Leaves* ½–2 in., from obovate to linear spathulate or subcylindric; petiole often dilated at base with scarious mar-

gins. *Flowers* solitary, axillary pedicel ¼ in. *Calyx* within a bright rose; segments ¼ in., cuspidate. *Stamens* 15–40, free or nearly so. *Styles* 3, less commonly 4 or 5. *Capsule* ⅕ in. *Seeds* not very many, obtusely keeled on the margin.

3. TRIANTHEMA, *Linn.*

Diffuse prostrate branched herbs, glabrous or papillose. *Leaves* petioled, opposite, unequal, from linear to ovate or obovate, entire; petioles connected at base by their dilated membranous margins; stipules 0. *Flowers* small, axillary, sessile or peduncled, solitary or in cymes or clusters. *Calyx-tube* short or long, lobes 5, often cuspidate, coloured within. *Petals* 0. *Stamens* 5–10 or more, inserted near the top of the calyx-tube. *Ovary* free, 1–2-celled; styles 1 or 2, subulate; ovules 1 or many, basal. *Capsule* membranous or coriaceous, clavate, circumsciss, the upper portion often carrying away 1 or 2 seeds attached to or enclosed in it, the lower portion 2–∞-seeded. *Seeds* reniform; embryo annular. —DISTRIB. Species 10, tropical and subtropical.

* *Style* 1.

1. **T. monogyna,** *Linn. Mant.* 69; calyx-tube scarious thin closely sheathed by the base of the petiole, stamens about 15. *DC. Prodr.* iii. 352, *Pl. Grass.* t. 109. T. obcordata, *Roxb. Hort. Beng.* 34, *Fl. Ind.* ii. 445; *Wall. Cat.* 6837, *excl.* F; *W. & A. Prodr.* 355; *Wight Ic.* t. 228; *Dalz. & Gibs. Bomb. Fl.* 14; *Kurz in Journ. As. Soc.* 1877, pt. ii. 110. T. pentandra β. obcordata, *DC. Prodr.* iii. 352.

Throughout INDIA and CEYLON, common.—DISTRIB. Malaya, Western Asia, Africa, Tropical America.

Glabrous. *Leaves* ½–1½ in., obovate; petiole ⅛ in. *Flowers* solitary. *Calyx-lobes* obtuse, cuspidate. *Stamens* 10–20. *Capsule* ⅕ in., scarious below, beak exserted coriaceous somewhat mitriform adnate to the enclosed seed, lower part 3–5-seeded. *Seeds* black, scarcely shining, with concentric broken undulating raised lines.

2. **T. crystallina,** *Vahl. Symb.* i. 32; calyx-tube herbaceous with many ribs not sheathed by the base of the petiole, stamens 5. *Roxb. Hort. Beng.* 34, *Fl. Ind.* ii. 444; *Wall. Cat.* 6840; *W. & A. Prodr.* 355; *Edgw. in Journ. Linn. Soc.* vi. 203; *Dalz. & Gibs. Bomb. Fl.* 14; *Kurz in Journ. As. Soc.* 1877, pt. ii. 110. T. triquetra, *Rottl.*; *DC. Prodr.* iii. 352. T. sedifolia, *Visian. Pl. Æg.* t. 3. Papularia crystallina, *Forsk. Fl. Æg. Arab.* 69.

From the PUNJAB to CEYLON: not in Bengal.—DISTRIB. Throughout Africa.

Minutely papillose or glabrous. *Leaves* ½–¾ in., narrowly oblanceolate or elliptic; petiole very short or obscure *Flowers* often very many, solitary densely clustered. *Calyx-lobes* triangular, cuspidate. *Capsule* $\frac{1}{12}$ in.; beak a circular corky flat disc depressed in the centre, deciduous often with one seed attached beneath or imperfectly included by a membrane. *Seeds* 2, super-imposed, discoid, black, scarcely shining, with concentric broken undulating raised lines.

** *Styles* 2.

3. **T. pentandra,** *Linn. Mant.* 79; stamens 5, beak of the fruit mitriform separating into two 1-seeded parts, lower portion of the fruit 2-seeded. *DC. Prodr.* iii. 352; *Edgw. in Journ. Linn. Soc.* vi. 202; *Boiss. Fl. Orient.* ii. 766. T. obcordata, *Wall. Cat.* 6837 F. T. Govindia, *Wall. Cat.* 6838.

The PUNJAB, SCINDE and plains of NORTH-WEST INDIA.—DISTRIB. Western Asia and Tropical Africa.

Papillæ or nearly glabrous. *Leaves* 1–1½ in., oblong or elliptic; petiole ¼ in. *Flowers* in sessile clusters. *Calyx-lobes* ovate, often scarious on the margin, bracts scarious. *Capsule* ⅛ in.; beak consisting of two lanceolar portions acute upwards, coriaceous, closely adnate to the included seed. *Seeds* in the lower half of the capsule 2, dull black, roughly puberulous, the concentric lineation very obscure.

4. **T. decandra,** *Linn. Mant.* 70; stamens 10, beak of the fruit truncate consolidated with the two included seeds indehiscent or only finally splitting. *Roxb. Hort. Beng.* 34, *Fl. Ind.* ii. 444; *DC. Prodr.* iii. 352; *Wall. Cat.* 6839; *W. & A. Prodr.* 355; *Wight Ic.* t. 296; *Dalz. & Gibs. Bomb. Fl.* 15; *Kurz in Journ. As. Soc.* 1877, pt. ii. 110. Zaleya decandra, *Burm. Fl. Ind.* t. 31, fig. 3.

DECCAN PENINSULA and CEYLON.—DISTRIB. Timor; Ava (*ex Kurz*).

Glabrous or minutely papillose. *Leaves* 1–1½ in., oblong or elliptic; petiole ⅛–¼ in. *Flowers* in nearly sessile clusters. *Calyx-lobes* ovate, usually obtuse, often scarious on the margins; bracts scarious. *Capsule* ⅛ in., beak a truncate solid cylinder, not at all or very obscurely mitriform. *Seeds* 4, 2 lower dull black puberulous, with numerous faint concentric raised lines.—Closely allied to the preceding species.

5. **T. hydaspica,** *Edgw. in Journ. Linn. Soc.* vi. 203; stamens 5–7, beak of the fruit conical thin not completely enclosing a seed. T. polysperma, *Hochst. in Oliv. Fl. Trop. Afr.* ii. 588.

MOOLTAN; *Edgeworth.* SCINDE; *Stocks.* BOMBAY; *Law.*—DISTRIB. East Tropical Africa.

Minutely papillose or glabrous, *Leaves* ½–1 in., oblong or elliptic, often with scarious margins; petiole ⅛–⅕ in. *Flowers* sessile, solitary and clustered. *Calyx-tube* 10-ribbed; lobes triangular-elongate, acute, dilated at base so that there appear to be 5 interjected auricles. *Capsule* ¼ in.; beak elongate-conical, hollow. *Seeds* about 10–15, dull black, with puberulous raised undulating lines that radiate from the centre (and thus are in a direction at right angles to the lines on the seeds of the four preceding species).—Flowers separated, or clustered. *T. polysperma, Oliv.* is undistinguishable from some of Stocks' Scinde specimens. *Diplochonium sesuvioides, Fenzl. in Harv. & Sond. Fl. Cap.* ii. 473 is separated by the very numerous stamens and shining seeds, as Edgeworth has noted.

4. **ORYGIA,** *Forsk.*

A rigid branched glabrous herb. *Leaves* opposite and alternate, fleshy, entire; stipules 0. *Cymes* terminal and leaf-opposite, lax, few-flowered. *Sepals* 5, nearly free, ovate. *Petals* 0. *Staminodes* many, small, subhypogynous. *Stamens* 12 or more, subhypogynous. *Ovary* free, globose, 5-ribbed, 5-celled; styles 5, filiform; ovules many, axile. *Capsule* globose, papery, wrapped in the persistent sepals; cells 5, dehiscing dorsally. *Seeds* many, reniform, strophiolate; embryo annular.

1. **O. decumbens,** *Forsk. Fl. Æg. Arab.* 103; *DC. Prodr.* iii. 455; *Boiss. Fl. Orient.* i. 755. Glinus trianthemoides, *Heyne in Roth Nov. Sp.* 231; *DC. l. c.*; *W. & A. Prodr.* 362; *Wight Ill.* t. 113. G. mucronata, *Klotzsch. in Peters Reis. Mossamb. Bot.* 140, t. 25. Portulaca decumbens, *Vahl Symb.* i. 33. Talinum decumbens, *Willd. Sp. Pl.* ii. 864. Axonotechium trianthemoides, *Fenzl. in Ann. Wien. Mus.* i. 354.

Dry and hot INDIA from the PUNJAB and SCINDE to MYSORE and Coimbatore. Not in Bengal.—DISTRIB. Western Asia and the whole of Africa.

Stems 6–18 in., somewhat angular or trigonous. *Leaves* $\frac{3}{4}$–1 in., obovate, cuspidate; petiole $\frac{1}{8}$ in. *Cymes* with small lanceolate bracts at their divisions; flowers $\frac{1}{8}$ in. diam., pedicelled. *Sepals* purplish-green, with scarious edges, acute. *Capsule* $\frac{1}{6}$ in. diam. *Seeds* black, not shining, with numerous concentric elevated lines.

5. MOLLUGO, *Linn.*

Herbs, branched, often dichotomous. *Leaves* often falsely whorled, or alternate, or all radical, from linear to obovate, entire; stipules quickly disappearing. *Flowers* axillary, sessile or pedicelled, clustered or in cymes or racemes, small, greenish; bracts inconspicuous. *Sepals* 5, persistent. *Petals* 0; staminodes 0 or small in the same species. *Stamens* 5–3, rarely many. *Ovary* free, globose or ellipsoid, 3–5-celled; styles 3–5, linear or very small; ovules many, axile. *Capsule* membranous, sheathed by the sepals, 3–5-celled, dehiscing dorsally. *Seeds* several in each cell, rarely 1, reniform, appendaged or not at the hilum; embryo annular.—DISTRIB. Species 12, tropical and subtropical.

* *Seeds with an appendage at the hilum, inflorescence in axillary clusters.*

1. **M. hirta,** *Thunb. Fl. Cap.* 120; flowers sessile or pedicelled, appendage of the seed a membranous scale from which proceeds a linear bristle that curls half round the seed. *DC. Prodr.* i. 391. M. Glinus, *A. Rich. Fl. Abyss.* i. 48; *Kurz in Journ. As. Soc.* 1877, pt. ii. 110. Glinus lotoides, *Linn.*; *Lamk. Ill.* t. 413; *DC. Prodr.* iii. 455; *Wall. Cat.* 1517; *W. & A. Prodr.* 362; *Sibth. Fl. Græc.* t. 472; *Dalz. & Gibs. Bomb. Fl.* 16; *Boiss. Fl. Orient.* i. 755. G. dictamnoides, *Linn. Mant.* 243; *DC. l. c.*; *Wall. Cat.* 1518; *W. & A. Prodr.* 362. *Boiss. l. c.* i. 756. G. parviflora, *Wall. Cat.* 1519. Pharnaceum pentagonum, *Roxb. Hort. Beng.* 22, *Fl. Ind.* ii. 103. Tryphera prostrata, *Blume*; *A. DC. Prodr.* xiii. pt. ii. 424.

Throughout INDIA and CEYLON, common.—DISTRIB. All warm regions.

Stellately woolly, sometimes less hairy, rarely glabrous. *Stem* prostrate, much branching, leafy. *Leaves* $\frac{1}{2}$–1 in., opposite or whorled, usually obovate but vary from round to narrow-lanceolate; petiole 0–$\frac{1}{4}$ in. *Flowers* usually sessile or nearly so; pedicels sometimes $\frac{3}{4}$ in. *Sepals* $\frac{1}{8}$–$\frac{1}{4}$ in., elliptic or oblong, acute. *Staminodes* linear or 0. *Stamens* usually 10 or more but vary to 5. *Styles* 3–5, linear, short. *Capsule* a little shorter than the sepals, oblong. *Seeds* many, covered with raised tubercular points; the appendage sometimes carrying more than one bristle.—A variable weed of which the following are the most notice-worthy varieties.

VAR. 1. *typica*; flowers sessile, sepals $\frac{1}{6}$ in. more or less stellately tomentose. Glinus dictamnoides, *W. & A. Prodr.* 362.

VAR. 2. *lotoides, W. & A. Prodr.* 362 (sp.); pedicels of the flowers $\frac{1}{2}$–$\frac{3}{4}$ in., sepals $\frac{1}{4}$ in. stellately tomentose.—Hills of the DECCAN PENINSULA.

VAR. 3. *Keenani*; stem slightly pubescent, leaves glabrous petioled lanceolate, flowers sessile, sepals $\frac{1}{8}$ in. glabrous with scarious margins, capsule oblong the seeds clearly seen through the walls, seeds exactly of Var. 1 but smaller than usual.—Cachar, *R. L. Keenan*; possibly a good species but it can be nearly matched out of the African bundles of Var. 1.

2. **M. Spergula,** *Linn.*; *DC. Prodr.* i. 391; glabrous or nearly so, flowers pedicelled, seed appendaged by a minute short subulate bristle. *Wall. Cat.* 653; *W. & A. Prodr.* 44; *Kurz in Journ. As. Soc.* 1877, pt. ii. 111. M. verticillata, *Roxb. Hort. Beng.* 9, *Fl. Ind.* i. 360, *not of Linn.* M. parviflora, *DC. Prodr.* i. 391. Pharnaceum parviflorum, *Roth, Nov. Sp.* 186. P. Mollugo, *Linn. Mant.* 561; *Roxb. Hort. Beng.* 22, *Fl. Ind.* ii. 102. Glinus Mollugo, *Fenzl in Ann. Wien. Mus.* i. 359.—*Rheede Hort. Mal.* x. t. 24.

From the base of the EASTERN HIMALAYA to CEYLON and BURMA; common. (No example from North-West India, the Punjab or Scinde.)—DISTRIB. Tropical Africa and Australia.

Stem branching, diffuse, leafy. *Leaves* $\frac{1}{2}$–1 in., usually whorled, spathulate lanceolate or elliptic; petiole 0–$\frac{1}{8}$ in. *Pedicels* $\frac{1}{8}$–$\frac{1}{2}$ in. *Sepals* $\frac{1}{8}$–$\frac{1}{2}$ in., oblong, margins often membranous. *Stamens* 5–10. *Stigmas* 3, minute. *Capsule* ellipsoid, a little shorter than the sepals. *Seeds* many, covered with raised tubercular points, the appendage sometimes comprises a second, yet more minute, bristle.

** *Seeds not appendaged, inflorescence in terminal cymes or racemes.*

3. **M. stricta,** *Linn.*; *DC. Prodr.* i. 391; glabrous, stems much branched leafy, seeds covered with raised tubercular points. *Wall. Cat.* 649; *W. & A. Prodr.* 44; *Dalz. & Gibs. Bomb. Fl.* 16; *Kurz in Journ. As. Soc.* 1877, pt. ii. 111. M. triphylla, *Lour. Fl. Cochinc.* 79; *DC. Prodr.* i. 392; *Roxb. Hort. Beng.* 9, *Fl. Ind.* i. 360; *Wall. Cat.* 651; *W. & A. Prodr.* 44. M. Linkii, *Seringe in DC. l. c.* M. pentaphylla, *Linn.*; *DC. Prodr.* i. 391; *Roxb. l. c.*; *Wall. Cat.* 650; *W. & A. Prodr.* 44; *Dalz. & Gibs. l. c.* Pharnaceum strictum, triphyllum and pentaphyllum, *Spreng. Syst.* i. 949.—*Rheede Hort. Mal.* x. t. 26.

Throughout INDIA and CEYLON, very common.—DISTRIB. Eastward to Malacca, China, Japan, Fiji.

Often a foot high. *Leaves* $\frac{3}{4}$–$1\frac{1}{2}$ in., whorled or opposite, varying from lanceolate acute to obovate obtuse, much narrowed at the base; petiole hence obscure. *Cymes* compound, the branches sometimes racemed so that the inflorescence becomes like that of *M. disticha*. *Sepals* $\frac{1}{16}$ in., elliptic or round. *Stamens* 3–5, filaments dilated. *Styles* 3, short, linear. *Capsule* as long as the sepals, globose, many-seeded, the walls thin. *Seeds* dark chestnut-coloured; embryo curled into three-quarters of a complete circle.

4. **M. Cerviana,** *Seringe in DC. Prodr.* i. 392; glabrous, branched, cauline leaves linear-oblong, seeds reticulated without tubercular raised points. *Wall. Cat.* 7128; *W. & A. Prodr.* 44; *Boiss. Fl. Orient.* i. 756. M. umbellata, *Seringe l. c.* Pharnaceum Cerviana, *Linn.*; *Lamk. Ill.* t. 214.

From the PUNJAB to CEYLON, in the hotter drier parts of India; not in Bengal.—DISTRIB. Asia, Africa to the Cape, Australia.

Stems 3–6 in., erect, usually several. *Leaves* $\frac{1}{2}$–$\frac{3}{4}$ in., radical tufted spathulate or obovate, cauline linear-oblong often 4–8 in a whorl, whence spring umbellately many branches. *Peduncles* trichotomous or umbellate-cymose. *Sepals* $\frac{1}{12}$ in., elliptic or round. *Stamens* 5. *Styles* very small. *Capsule* as long as the sepals, globose, many-seeded. *Seeds* pink-chestnut or yellowish, covered with slightly elevated oblong reticulations, bluntly ridged on the back; embryo curled through less than a semicircle.

5. **M. disticha,** *Seringe in DC. Prodr.* i. 392; glabrous, branched, cauline leaves lanceolate, seeds smooth. *Wall. Cat.* 652; *W. & A. Prodr.* 44; *Wight Ic.* t. 3. Pharnaceum distichum, *Linn. Mant.* 221.

SOUTH DECCAN PENINSULA and CEYLON.

Stems often 12–18 in. *Leaves* $\frac{1}{2}$–1 in., usually whorled, tapering almost to the base. *Flowers* in cymes, the branches often ultimately prolonged as racemes. *Sepals* $\frac{1}{8}$–$\frac{1}{6}$ in., ovate. *Stamens* 5. *Styles* 3, short. *Capsule* as long as the sepals, globose or shortly ellipsoid, many-seeded. *Seeds* obscurely reticulated, shining chestnut, bluntly ridged on the back; embryo curved through three-quarters of a circle.—Wight's figure represents this plant as hairy: it is glabrous or sometimes microscopically puberulo-glandular.

6. **M. nudicaulis,** *Lamk. Dict.* iv. 234; glabrous, stems many leafless rising from a tuft of radical leaves. *DC. Prodr.* i. 391; *Wall. Cat.* 648; *W. & A. Prodr.* 43. M. bellidifolia, *Seringe in DC. Prodr.* i. 391. Pharnaceum spathulatum, *Spreng. Syst.* i. 948.—Alsine, *Burm. Fl. Zeyl.* t. 8.

From the PUNJAB to CEYLON in the hotter drier parts of India; not in Bengal.—DISTRIB. New Caledonia, Tropical Africa, Cuba.

Leaves 1–2 in., elliptic, tapering to the base. *Scapes* 3–8 in., wiry, repeatedly dichotomous. *Sepals* $\frac{1}{12}$ in., oblong. *Stamens* 5–3 (Oliver). *Stigmas* 3, very small. *Capsule* as long as the sepals, somewhat ellipsoid, many-seeded. *Seeds* black, a microscopic scale appendaged to the hilum, obscurely ridged on the back, shining, closely densely reticulated, very obscurely rough not tuberculated; embryo curved through half a semicircle—New Caledonian examples have the seeds rougher, and a very short linear spur added to the appendage. Cuban examples resemble generally the Indian, but one of them has the stem very woody thick branched densely packed with leaves.

6. GISEKIA, *Linn.*

Diffuse branched herbs. *Leaves* opposite or falsely whorled, fleshy, spathulate, abounding in raphides; stipules 0. *Flowers* sessile and pedicelled, hermaphrodite or polygamous, small, greenish or purplish, in axillary cymes. *Sepals* 5, nearly free, ovate, herbaceous with membranous margins. *Petals* 0. *Stamens* (in the Indian species) 5, hypogynous. *Carpels* 5–3, distinct; each ending in a short simple style and containing one basal ovule. *Fruit* of 5, free, membranous, papillose, indehiscent, carpels. *Seeds* vertical, subreniform; embryo curved.—DISTRIB. Species 5, in India, Arabia, and Africa.

1. **G. pharnaceoides,** *Linn. Mant.* 562; cymes dense, carpels covered with papillæ. *Roxb. Cor. Pl.* t. 183 (*not good*); *Wight Ic.* t. 1167; *A. DC. Prodr.* xiii. pt. ii. 27; *Kurz in Journ. Linn. Soc.* 1877, pt. ii. 111. G. molluginoides, *Wight Ic.* t. 1168. G. linearifolia, *Schum.*; *A. DC. Prodr. l. c.* Pharnaceum occultum, *Forsk. Fl. Æg. Arab.* 58.

The PUNJAB, SCINDE, SOUTH DECCAN PENINSULA and CEYLON.—DISTRIB. Affghanistan, Africa, Ava (*Wallich*).

Glabrous. *Stems* 8–18 in. *Leaves* $\frac{3}{4}$–$1\frac{1}{2}$ in., oblong or elliptic, entire, narrowed at the base; petiole 0–$\frac{1}{4}$ in. *Sepals* $\frac{1}{16}$ in. *Filaments* dilated below. *Carpels* usually 5, in fruit as long as the sepals. *Seeds* blackish, smooth, minutely glandular-punctate; embryo curved less than a semicircle.

7. LIMEUM, *Linn.*

Branched, mostly prostrate herbs; glandular or glabrous. *Leaves* alternate or subopposite; stipules 0. *Flowers* bracteate, cymed, hermaphrodite or unisexual, small, green. *Sepals* 5, nearly free, ovate, herbaceous with membranous margins. *Petals* (in the Indian species) 3–5, small. *Stamens* 5–10, hypogynous; filaments dilated downwards and somewhat connate at the base. *Ovary* globose, 2-celled; stigmas 2, short; ovule 1 in each cell, basal. *Fruit* separating vertically into two coriaceous hemispherical cocci, which at length dehisce ventrally. *Seeds* vertical, reniform; embryo annular.—DISTRIB. Species 10, African, one reaching the west of India.

1. **L. indicum.** *Stocks ms. ex T. Anders. in Journ. Linn. Soc.* v. *Suppl.* 30; leaves spathulate round, capsule smooth. *Oliv. Fl. Trop. Afr.* ii. 596.

PUNJAB; *Edgeworth, Vicary, Aitcheson.* SCINDE; *Stocks.*—DISTRIB. Aden, Nubia. Subprostrate, glandular-puberulous or glabrate; branches 8–18 in., much divided. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ in., opposite or nearly so petiole $\frac{1}{8}$ in. *Cymes* sessile (or nearly so) at the nodes. *Sepals* $\frac{1}{8}$ in., roundish. *Petals* much shorter than the sepals, obovate, clawed, the upper margin incised or nearly fimbriate. *Stamens* 6–7 (Oliver). *Carpels* in fruit as long as the sepals, hemispheric, dehiscing ventrally; margins of the valves inflexed so as to retain the seed until moistened. *Seed* reniform, longer than broad, compressed, concavo-convex, perfectly smooth, whitish.

ORDER LXX. **UMBELLIFERÆ.** (By C. B. Clarke.)

Herbs (rarely in non-Indian species shrubs or trees). *Leaves* alternate, usually divided or dissected, sometimes simple, petiole generally sheathing at the base; stipules 0. *Flowers* hermaphrodite or polygamous, in compound umbels (simple in *Hydrocotyle* and *Bupleurum*), exterior of the umbel sometimes radiant; umbels with involucriform bracts at the base of the general one and bracteoles at the base of the partial ones (umbellules). *Calyx-tube* adnate to the ovary, limb 0 or 5-toothed. *Petals* 5, epigynous, often unequal, and with a median fold on the face, plane or emarginate or 2-lobed with the apex inflexed; imbricated in bud, in *Hydrocotyle* sometimes valvate. *Stamens* 5, epigynous. *Ovary* inferior, 2-celled, disc 2-lobed; styles 2, stigmas capitellate; ovules 1 in each cell, pendulous. *Fruit* of 2 indehiscent dorsally or laterally compressed carpels, separated by a commissure; carpels each attached to and often pendulous from a slender often forked axis (carpophore), with 5 primary ridges (1 dorsal, 2 marginal and 2 intermediate) and often 4 secondary ones intercalated between these; pericarp often traversed by oil canals (vittæ). *Seed* 1 in each carpel, pendulous, albumen cartilaginous; embryo small, next the hilum, radicle superior. — DISTRIB. Species 1,300, mainly in Europe, North Africa, West Central and North Asia; a few are North American, tropical, and natives of the Southern Hemisphere.

Tordylium is stated in *Gen. Pl.* i. 871 to be Himalayan. We have seen no specimens.

An umbellifer in flower, Edgw. No. 175½ from the North-west Himalaya, alt. 6000–7000 ft., may be *Johrenia alpina*, Fenzl.

Clavis of the Genera (*as to the Indian species only*).

SERIES I. **Heterosciadiæ.** *Umbels* simple or irregularly compound. *Vittæ* 0.

Leaves undivided. Stipulate. Fruit laterally compressed . 1. HYDROCOTYLE.
Leaves spinulose-serrate. Flowers capitate . . . . 2. ERYNGIUM.
Leaves compound not spinulose. Umbels subcorymbose . . 3. SANICULA.

SERIES II. **Haplozygiæ.** *Umbels* compound. Secondary ridges of the fruit inconspicuous (except in *Trachydium 9-jugum*).

TRIBE I. **Ammineæ.** *Fruit* laterally compressed, or at least constricted at the commissure, not or very obscurely winged.

* *Carpels in outline ovate or oblong, not distinctly narrowed upwards, excavated or concave on the inner face; seed grooved or concave on the inner face.*

Bracteoles simple, linear . . . . 4. VICATIA.
Bracteoles lobed or pinnatifid . . . . 5. TRACHYDIUM.
Bracteoles entire, lanceolate, white-margined . . . . 6. ELÆOSTICTA.

*** Carpels in outline ovate or oblong, not distinctly narrowed upwards, plane on the inner face; seed plane or concave on the inner face.*

Leaves entire. Flowers yellow or lurid . . . . 7. BUPLEURUM.
Umbels short-peduncled, leaf-opposed, ebracteolate . . . . 8. APIUM.
Ridges of the fruit thick, corky . . . . 9. CICUTA.
Stem rigid, branched, almost leafless. Fruit densely hairy . 10. PITURANTHOS.
Ridges of the fruit slender, valleys 1-vittate . . . . 11. CARUM.
Ridges of the fruit obtuse, corky, valleys 2–3-vittate . . . 12. SIUM.
Ridges of the fruit slender, valleys 2–3-vittate . . . . . . 13. PIMPINELLA.

**** Carpels in outline elongate oblong; seed in horizontal section nearly circular, grooved on the inner face.*

Ultimate segments of the leaves large, fruit attenuate at base . 14. OSMORRHIZA.
Fruit oblong, narrowed upwards, distinctly ridged, glabrous . 15. CHÆROPHYLLUM.
Fruit narrowed upwards into a long beak . . . . 16. SCANDIX.
Fruit oblong, narrowed upwards, obscurely ridged, hispid . . 17. ANTHRISCUS.

TRIBE II. **Seselineæ.** *Fruit* widest at the commissure, in horizontal section circular or somewhat dorsally compressed.

** Primary ridges of the fruit more or less distinct, not alate.*

Fruit globose or subcylindric, ridges distinct. Petals white . 18. SESELI.
Central flower of the umbellule sessile perfect, lateral male pedicelled . . . . 19. PYCNOCYCLA.
Leaves cut into filiform segments. Bracts 0. Petals yellow . 20. FŒNICULUM.
Fruit ¾ in., roughly corrugate between the ridges . . . . . 21. PRANGOS.
Fruit with all the ridges equal, broad, obtuse, corky . . . . 22. ŒNANTHE.
Bracts prominent. Fruit ovoid, vittæ ∞ . . . . 23. SCHULTZIA.
Bracts 0, or small. Fruit ovoid, vittæ ∞ . . . . 24. POLYZYGUS.

*** Primary ridges of the fruit (or the lateral only) more or less excurrent, winged.*

† Valleys next the dorsal ridge 2–3-vittate.

Petals emarginate. Fruit less than ¼ in. . . . . 25. LIGUSTICUM.
Petals subentire. Fruit ¼ in. . . . . 30. ARCHANGELICA.

†† Valleys next the dorsal ridge 1-vittate (very rarely 1 or 2 additional small superficial vittæ are present), in Pleurospermum Candollii *3–2-vittate.*

Tall. Leaves very compound. Seed plane on the inner face . 26. SELINUM.
Stemless, or short. Carpels much compressed dorsally . . . 27. CORTIA.
Seed grooved or concave on the inner face . . . . 28. PLEUROSPERMUM.
Leaves compound pinnate with large segments. Fruit ¼ in. . 29. ANGELICA.

TRIBE III. **Peucedaneæ.** *Fruit* much dorsally compressed, dorsal ridges slightly excurrent lateral winged, wings of the opposite carpels closely applied face to face.

Petioles of the leaflets winged. Petals yellow. Fruit ½ in. . 31. FERULA.
Flowers not radiant. Ovary glabrous . . . . 32. PEUCEDANUM.
Ovary pubescent. Vittæ rarely reaching the base of the fruit 33. HERACLEUM.
Wings of carpels hyaline with a very thick border . . . . . 34. ZOSIMIA.

SERIES III. **Diplozygiæ.** *Umbels* compound. Secondary ridges of the fruit prominent, primary equally or less prominent or inconspicuous.

* *Fruit glabrous.*

Fruit globose. Bracts 0 . . . . 34.* CORIANDRUM.
Fruit narrowly oblong. Bracts slender, simple . . . . . . 34.** CUMINUM.

** *Fruit hirsute or setose.*

Bracts pinnate. Seed plane on the inner face . . . . 35. DAUCUS.
Bracts linear, or 0. Seed grooved on the inner face . . . . 36. CAUCALIS.
Bracts linear-lanceolate, membranous . . . . 37. PSAMMOGETON.

1. HYDROCOTYLE, *Linn.*

Prostrate herbs, rooting at the nodes. *Leaves* (in the Indian species) cordate or hastate, not peltate, round or 5–9-gonal, subentire or palmately lobed, palmate-nerved, long-petioled; stipules small, scarious. *Umbels* (in the Indian species) simple, small; bracts small or 0; flowers white, sometimes unisexual. *Calyx-teeth* 0 or minute. *Petals* entire, valvate or imbricate. *Fruit* laterally compressed, commissure narrow; carpels laterally compressed or subpentagonal; lateral primary ridges concealed within the commissure, or distant therefrom and prominent; vittæ 0, or most slender, obscure; carpophore 0. *Seed* laterally compressed.—DISTRIB. Species 70; in wet places in tropical and temperate regions, more numerous in the Southern Hemisphere.

SECTION I. **Eu-Hydrocotyle.** *Petals* acute, valvate. Secondary ridges 0. *Pericarp* not thickened.

1. **H. javanica,** *Thunb. Dissert.* ii. 415, t. 3; leaves 1–3 in. diam. cordate crenate, subentire or lobed to the middle, petiole laxly pubescent, peduncles long upper often clustered, fruit much compressed not pentagonal. *DC. Prodr.* iv. 67; *Miq. Fl. Ind. Bat.* i. pt. i. 734; *Kurz in Journ. As. Soc.* 1877, pt. ii. 113. H. hispida, *Don Prodr.* 183. H. nepalensis, *Hook. Exot. Fl.* t. 30; *Wall. Cat.* 561; *DC. l. c.* 65; *Miq. l. c.* 735. H. zeylanica, *DC. l. c.* 67; *W. & A. Prodr.* 366; *Miq. l. c.* 734. H. hirsuta, *Blume Bijd.* 884. H. polycephala, *W. & A. Prodr.* 366; *Wight Ic.* t. 1003. H. hirta, *R. Br. Var. acutiloba, F. Muell.*; *Benth. Fl. Austral.* iii. 340. H. Heyneana, *Wall. Cat.* 563. H. strigosa, *Ham. in Wall. Cat.* 7219.

HIMALAYA; from KASHMIR to BHOTAN, alt. 2000–8000 ft.; KHASIA MTS., alt. 2000–6000 ft., common. Mts. of MALABAR and CEYLON, common. PEGU and TENASSERIM, alt. 2000–5000 ft.—DISTRIB. Malaya to the Philippines and Australia, Mozambique.

Leaves 1–3 in. diam., pubescent or glabrous. *Peduncles* $\frac{1}{4}$–2 in., lower solitary, leaf-opposed. *Umbels* many-flowered; bracts minute lanceolate scales among the pedicels; pedicels 0–$\frac{1}{5}$ in., glabrous. *Fruit* $\frac{1}{10}$ in., orbicular or subquadrate, reticulate-rugose or smooth (sometimes deformed, enlarged, obovoid, corky); lateral primary ridges commissural, intermediate faint or 0; pericarp hard, thin.—*Fruits* exceedingly uniform even in minute characters from the Himalaya to Ceylon. Thunberg describes *H. javanica* as glabrous, but all the specimens so named from Java have at least the petioles and peduncles pubescent and are identical with the Indian. *H. hirsuta, Blume*, is a form with fulvous pubescence abundant in the Eastern Himalaya.—*H. polycephala*, Wight Ill. t. 117, fig. 1, represents the carpels as subpentagonal and little compressed laterally, and perhaps was taken from *H. rotundifolia*.

3653 VAR. 1. *podantha*, Molkenboer in Pl. Jungh. 89 (sp.); pedicels $\frac{1}{4}$ in. *Miq. Fl. Ind. Bat.* i. pt. i. 732.—Sikkim, Bhotan, Khasia, frequent.—Peduncles sometimes 3 in. Fruits ovoid, intermediate primary ridges 0.—Referred to *H. podantha* from the description only; Molkenboer relies partly on the leaves being setulose, but so they are in typical *H. javanica.* H. laxiflora, *DC. Prodr.* iv. 61 (= H. densiflora, *DC. Prodr.* iv. 61), does not differ unless by the fruits being slightly less compressed.

3980 VAR. 2. *Hookeri*; leaves very pentagonal little lobed, peduncles 6 in., fruit little compressed yellowish shining with red glandular dots.—Khasia, alt. 5000–6000 ft.; *H.f. & T.*—*Leaves* $2\frac{1}{2}$ in. diam., sparingly setulose. *Fruit* somewhat pentagonal, the immediate primary ridges more defined, nearly as in *H. rotundifolia.* This may be a distinct species.

2. **H. burmanica,** *Kurz in Journ. As. Soc.* 1871, pt. ii. 60, and 1877, pt. ii. 113; quite glabrous, leaves 5-lobed to the middle, lobes triangular acute crenate, peduncles long, pedicels $\frac{1}{5}$ in., fruit moderately compressed somewhat pentagonal.

UPPER TENASSERIM; alt. 3000–5000 ft.; *Brandis, Parish.*

Leaves $1-2\frac{1}{2}$ in. diam. *Peduncles* $1-2\frac{1}{2}$ in., lower solitary leaf-opposed, upper 2–3-nate. *Umbels* many-flowered; bracts minute. *Fruit* $\frac{1}{10}$ in., broadly orbicular, obscurely punctate not reticulate; lateral primary ridges commissural, intermediate appearing as slightly elevated angles; pericarp hard, thin.—Very near *H. javanica,* differing in its glabrousness, 5-gonous leaves, and less compressed fruits. It may be *H. javanica* (cf. *Hiern in Oliv. Fl. Trop. Afr.* iii. 4) when No. 1 must be called *H. hirsuta, Blume.*

3. **H. conferta,** *Wight Ic.* t. 1002; leaves cordate crenate subentire or lobed to the middle, petiole laxly pubescent, umbels subsessile, fruit somewhat compressed subpentagonal.

SOUTH DECCAN; Pulney Mts., *Wight*; Nilgherry Mts., *Gardner, Schmidt.*

Leaves $1-2\frac{1}{2}$ in. diam., setulose. *Umbels* 5–15-flowered; peduncle when visible glabrous, any bracts obscure. *Fruit* $\frac{1}{10}$ in., orbicular, obscurely punctate, not reticulate; lateral primary ridges commissural, intermediate, appearing as slightly elevated angles; pericarp hard, thin.—From the size and hairiness of the leaves this has been supposed near *H. javanica,* differing by its sessile clusters of fruit in the axils; but in the structure of its fruit it is exceedingly like *H. rotundifolia* with which indeed it is mixed by Wight; and from some forms of which it hardly differs but by the larger more hairy leaves.

4. **H. rotundifolia,** *Roxb. Hort. Beng.* 21, *Fl. Ind.* ii. 38; leaves orbicular-cordate subentire or lobed to the middle or lower, pedicels 0, fruit somewhat compressed pentagonal. *Wall. Cat.* 562; *DC. Prodr.* iv. 64; *Wight Ic.* t. 564. H. nitidula, *A. Richd.*; *DC. Prodr.* iv. 66; *Hook. Ex. Fl.* t. 29. H. tenella, *Don Prodr.* 183; *DC. l. c.* 64; *W. & A. Prodr.* 366. H. ranunculoides, *Blume Bijd.* 884 (*fide Molkenboer*). H. puncticulata, *Miq. Fl. Ind. Bat.* i. pt. i. 733. H. Zollingeri, *Molkenb.*; *Miq. l. c.* 733. H. perexigua, *Hance in Walp. Ann.* ii. 691.

NORTH-WEST HIMALAYA; alt. 4000–7000 ft. BENGAL PLAIN, ascending to 4000 ft. in SIKKIM and KHASIA, frequent. Mts. of MALABAR and CEYLON, *Wight.*—DISTRIB. Throughout Malaya. Guinea.

Leaves $\frac{1}{4}-1$ in. diam., glabrous and shining or pubescent or subvillous on both surfaces. *Peduncles* glabrous, $0-\frac{3}{4}$ in., sometimes on the same specimen; bracts obscure; umbels 10–15-flowered. *Fruit* $\frac{1}{12}$ in., broadly orbicular, smooth, sometimes punctate; lateral primary ridges commissural (more prominent than in the three preceding species), intermediate forming elevated angles; pericarp hard, thin.—Easily separated from the three preceding species by the much smaller leaves. The multiplication of names is chiefly due to the variability in the length of the peduncle, the specimens

being in other respects very uniform. Some of the hill examples have shining glabrous subserrate leaves, the peduncles $\frac{3}{8}$ in.; other plains' examples closely procumbent on mud are villous with sessile umbels. *H. hirta, R. Br.* differs (if at all) by its laxly hairy peduncles: see *Benth. Fl. Austral.* iii. 340, as to *Var. pusilla* only. *H. sibthorpioides, Lamk.*; *DC. Prodr. l. c.* 66, which extends throughout South-Eastern Asia and Japan, only differs (from the form *nitidula*) by the rather larger leaves and longer peduncles.

SECTION II. **Centella.** *Petals* obtuse, imbricate. Secondary ridges as distinct as the primary. *Pericarp* much thickened.

5. **H. asiatica,** *Linn.*; *Roxb. Hort. Beng.* 31, *Fl. Ind.* ii. 88; leaves orbicular-reniform entire crenate or lobulate, peduncle short, bracts small ovate embracing the flowers, pedicels 0, umbel 3–6-flowered. *Wall. Cat.* 560; *DC. Prodr.* iv. 62; *W. & A. Prodr.* 366; *Wight Ic.* t. 565; *Dalz. & Gibs. Bomb. Fl.* 105; *Kurz in Journ. As. Soc.* 1877, pt. ii. 113. H. Wightiana, *Wall. Cat.* 7220. H. lurida, *Hance in Walp. Ann.* ii. 690.—*Rheede Hort. Mal.* x. t. 46.

Throughout INDIA, alt. 0–2000 ft.; from the HIMALAYA to CEYLON and MALACCA; frequent.—DISTRIB. Tropical and subtropical regions.

Leaves $\frac{1}{2}$–$2\frac{1}{2}$ in. diam., usually glabrous or nearly so; petiole pubescent or glabrous. *Peduncles* about $\frac{1}{4}$ in., often 2–3-nate, laxly pubescent or glabrous; bracts $\frac{1}{8}$–$\frac{1}{6}$ in., not scattered among the pedicels (as in *Eu-Hydrocotyle* and in *Araliaceæ*). *Fruit* $\frac{1}{8}$–$\frac{1}{6}$ in. *Carpels* oblong, subcylindric, curved, slightly compressed, much longer than broad, reticulate-rugose, often crowned by the subpersistent petals, each with 9 curvilinear subsimilar ridges, and 2 within the commissure; pericarp thickened, woody, white. *Seed* compressed laterally.—In this species it seems to be the endocarp that is so greatly thickened, and that is adnate to the exocarp, thus invalidating one of the most uniform distinctions between *Umbelliferæ* and *Araliaceæ* (see *Gen. Pl.* i. 861).

2. ERYNGIUM, *Linn.*

Spinescent, glabrous, erect, perennial *herbs* (the Indian species). *Leaves* spinous-toothed, entire lobed or dissected. *Flowers* in simple heads, each bracteolate; bracts stellate, spinulose (in Indian species). *Calyx-tube* covered with ascending hyaline scales; teeth rigid, acute. *Petals* white, narrow, erect, emarginate, scarcely imbricate. *Fruit* ellipsoid, nearly cylindric: carpels dorsally subcompressed, subconcave on the inner face; primary ridges obtuse not prominent, secondary 0; vittæ in the primary ridges inconspicuous or 0, with some very slender scattered in the endocarp; carpophore 0. *Seed* semi-terete, dorsally subcompressed, subconcave on the inner face.—DISTRIB. Species 100, temperate and tropical; plentiful in Western Asia.

1. **E. cœruleum,** *Bieb. Fl. Taur. Cauc.* i. 200, *excl. syn.*; radical leaves long-petioled cordate-oblong undivided crenate not spinulose, upper cauline sessile palmately divided into lanceolate spinulose segments. *Boiss. Fl. Orient.* ii. 823.—E. planum, *Lindl. in Royle Ill.* 232, *not of Linn.*

KASHMIR, alt. 5000–6000 ft.; *Falconer, T. Thomson, Levinge.*—DISTRIB. Cabul, Persia, Turkestan.

Stems 2–3 ft., erect, undivided below, corymbose and often bluish above. Radical *leaves* 5 by $1\frac{3}{4}$ in., petiole 2–6 in.; lower cauline often similar smaller with shorter petioles, but more often subsessile, elliptic, acute, undivided, serrate or subspinulose. *Bracts* 5–6, 1 in., linear, with a few spines on the margins, sometimes short exterior spines alternating with them; *bracteoles* linear, spinulose, simple, exceeding the flowers; a few (in the outermost row but one) sometimes spinous, subtrifid. *Calyx-tube* densely scaly; teeth lanceolate-subulate, spinescent. *Fruit* $\frac{1}{8}$ in.—This

has been referred to *E. dichotomum, Desf.* which has the radical leaves oblong entire not spinulose and altogether differs. It is certainly Boissier's plant referred by him to Biebersteins.

2. **E. Billardieri,** *Delaroche Eryng.* 25, t. 2; radical leaves long-petioled 3-partite segments 3-fid or pinnatifid spinous-toothed, cauline sessile palmately 3–5-partite. *DC. Prodr.* iv. 88; *Boiss. Fl. Orient.* ii. 825. E. Kotschyi, *Boiss. Diagn. ser.* 2, v. 97. E. cærulescens, *Jacquem. Journ.*

KASHMIR, alt. 5000–6000 ft.; *Jacquemont, Falconer,* &c. LADAK; *T. Thomson.* SCINDE; *Stocks.*—DISTRIB. Western Asia.

Stem 6–18 in., erect or branching from the base, corymbose often bluish above. Radical *leaves* 2–4 in. diam., often hastate; petiole 2–4 in.; lower cauline sometimes similar but short-petioled. *Bracts* 5–7, 1 in., linear, with few or 0 spines on the margins; short spines alternate with and somewhat exterior to the bracts; *bracteoles* linear, spinulose, simple, exceeding the flowers. *Calyx-tube* with lanceolate scales, teeth lanceolate-subulate spinescent. *Fruit* $\frac{1}{8}$ in.—The Indian examples are all smaller with smaller heads than the type-specimens of *E. Billardieri* and are perhaps *Var. meiocephalum,* Boiss. l. c. The bracts are frequently without spines, but the radical leaves are not narrowly dissected enough for *E. Heldreichii, Boiss. l. c.* 826. The radical leaves early disappear, it is then much like *E. cæruleum* but can generally be distinguished by its much less strict stem and dissected lower cauline leaves.

3. SANICULA, *Linn.*

Erect *herbs. Leaves* palmately 3–5-partite, segments toothed lobed or dissected. *Umbels* irregularly compound, rays few; bracts sessile, leaf-like; umbellules usually small with small bracteoles. *Flowers* mostly unisexual. *Calyx-tube* villous, subechinate; teeth herbaceous. *Petals* white, emarginate, slightly imbricate. *Fruit* echinate, ovoid or slightly compressed laterally, commissure broad, carpophore 0; carpels $\frac{1}{2}$-terete or subterete, plane on the inner face, ridges all obscure, lateral primary commissural; vittæ small, solitary in each primary ridge, with some very slender scattered in the endocarp. *Seed* nearly terete.—DISTRIB. Species 10, 1 only in the Old World.

1. **S. europæa,** *Linn.*; *DC. Prodr.* iv. 84; leaves glabrous mucronate-serrate, bracteoles linear shorter than the fruits, perfect flowers sessile male usually pedicelled. *Boiss. Fl. Orient.* ii. 832; *Kurz in Journ. As. Soc.* 1877, pt. ii. 114. S. elata, *Ham.*; *Don Prodr.* 183; *Wall. Cat.* 559; *DC. l. c.* 85; *W. & A. Prodr.* 367; *Wight. Ill.* t. 117, fig. 2; *Wight Ic.* tt. 334, 1004. S. javanica, *Blume Bijd.* 882; *DC. l. c.* 85. S. montana, *Reinw.*; *DC. l. c.* 85. S. hermaphrodita, *Ham.*; *Don Prodr.* 183.

HIMALAYA; from KASHMIR to BHOTAN; alt. 4000–12,000 ft.; common. KHASIA MTS., alt. 3000–5500 ft.; common. BURMA. Mts. of MALABAR and CEYLON.—DISTRIB. Europe, Asia, Africa.

Height 1–3 ft. Radical *leaves* 2–6 in. diam., persistent; petiole 1–6 in. *Umbel* 2–3 to 18 in. diam.; rays divaricate, repeatedly 2–3-chotomous. *Umbellules* few-flowered; male pedicels often $\frac{1}{8}$ in. *Calyx-teeth* lanceolate. *Fruit* $\frac{1}{10}$ in., densely covered with hooked bristles, slightly compressed laterally.

4. VICATIA, *DC.*

Perennial *herbs,* glabrous. *Leaves* pinnately compound, ultimate segments narrow. *Umbels* compound; bracts 1 linear, small, or 0; bracteoles several, linear. *Calyx-margin* obsolete. *Petals* obovate, emarginate, white pink or

purple-red. *Fruit* ovoid, narrowed at the apex, scarcely laterally compressed, distinctly constricted at the commissure. *Carpels* grooved on the inner face, subpentagonal or subterete, dorsally subcompressed; lateral primary ridges commissural, intermediate slender but distinct; vittæ 2–3 in each furrow, not large; carpophore entire or bifid. *Seed* subterete, grooved on the inner face.—DISTRIB. Species 2–3, Himalayan.

Separable from *Pimpinella* only by the deeper groove on the inner face of the mericarps as DC. states.

1. **V. coniifolia,** *DC. Prodr.* iv. 243; ultimate segments of the leaves linear, carpels ovate broadly grooved on the inner face. Sison ? coniifolium, *Wall. Cat.* 591. Chærophyllum gracillimum, *Klotzsch in Reis. Pr. Waldem. Bot.* 149, t. 46. Ligusticum ? meoides, *Jacquem. Journ.*

HIMALAYA, alt. 6000–12,000 ft., from BALTISTAN and KASHMIR to NIPAL, common.

Stem 1–2 ft., ascending, divided, striate, sparingly leafy. *Leaves* usually 3-pinnate, ultimate segments linear or narrowly oblong-linear, acute. *Peduncle* 2–6 in. *Bract* rarely exceeding $\frac{1}{3}$ in., very rarely more than 1 or slightly divided; primary rays of the *umbel* 6–12, $\frac{1}{2}$–2 in., rigid, angularly striate; bracteoles 3–6, often as long as the umbellule. *Fruit* $\frac{1}{8}$–$\frac{1}{6}$ in., disc prominent, styles short.

2. **V. millefolia,** *C. B. Clarke*; ultimate segments of the leaves setaceous, carpels oblong narrowly grooved on the inner face. Chærophyllum millefolium, *Klotzsch in Reis. Pr. Waldem. Bot.* 149, t. 45.

KASHMIR; Tragbol, alt. 11,400 ft., *C. B. Clarke.* ? NIPAL; *Hoffmeister.* SIKKIM; Jongri, alt. 12,000–13,000 ft., *C. B. Clarke.*

Stem 4–6 in., rarely 12 in. Cauline *leaves* 2–4 in., 2–3–4-pinnate, ultimate segments scarcely $\frac{1}{12}$ in. *Fruit* $\frac{1}{16}$–$\frac{1}{12}$ in., oblong or narrow-oblong; disc prominent; styles short.—United with *V. coniifolia* by Bentham (*in Gen. Pl.* i. 883), but the fruit is very much smaller, less grooved on the inner face, and the leaves are much more finely cut.

3. **V. ? Stewartii,** *C. B. Clarke*; secondary pinnæ of the cauline leaves deeply cut into small narrow-lanceolate teeth, carpels plane on the inner face, seed with a T-shaped groove on the inner face.

GURWHAL, alt. 6500 ft., *Stewart.*

Bracts small or 0. *Bracteoles* linear, unequal, some overtopping the flowering umbellules. *Fruit* (not quite ripe) $\frac{1}{5}$ in., rather larger than that of *V. coniifolia*, ridges obscure; vittæ in each furrow 3-4, small.

5. TRACHYDIUM, *Lindl.*

Perennial *herbs*, glabrous or minutely hirsute. *Leaves* 1- 2- or 3-pinnate. *Umbels* compound, sometimes sessile, when the inflorescence appears to consist of simple umbels on clustered long peduncles; bracts several, foliaceous, lobed or pinnate; bracteoles 5–10, similar, often united at the base, sometimes white membranous on the margins, often equalling the rays. *Calyx-margin* obsolete or prominent, entire or nearly so. *Petals* white or pink, elliptic, subacute, or emarginate by the greater or less inflexion of the apex. *Fruit* ovoid or subquadrate, laterally subcompressed, slightly constricted at the commissure, smooth or tubercled; carpels terete; primary ridges distinct, sometimes thickened, spongy, rugose or tubercled, lateral at the commissure; secondary

ridges 0, or like the primary; vittæ 1–2 between each primary ridge; carpophore entire 2-fid or 2-partite. *Seed* subpentagonal, lunate, dorsally subcompressed, concave on the inner face.—DISTRIB. Species 10, Himalayan or Central Asiatic, and 1 Abyssinian.

SUBGEN. **Enneazygon.** *Fruit* truncate; calyx-margin spongy, patent; ridges of the carpels 9, equal, hollow, obtuse.

1. **T. novem-jugum,** *C. B. Clarke*; radical leaves pinnate, pinnæ orbicular crenate.—Trachydium sp. 5, *Herb. Ind. Or. H. f. & T.*

SIKKIM, alt, 12,000–15,000 ft.; Lama Kangra, Tungu, and Yeumtong; *J. D. H.*

Stem 0–2 in., grooved, thick, hollow. Radical *leaves* 3 in.; pinnæ 7, $\frac{1}{8}$ in. diam., reticulate-nerved. *Bracts* like reduced leaves with narrower pinnæ; bracteoles linear-obovate, toothed lobed or subpinnatifid. *Umbels* often subsessile; rays 2–3 in., thick, often hollow; rays of the umbellule often 15–20. *Petals* lurid green. *Styles* very small. *Fruit* $\frac{1}{12}$–$\frac{1}{10}$ in., ovoid, subquadrate, somewhat cordate at the base, slightly narrowed close under the calyx-margin which is wider than the summit of the fruit; style bases depressed, inconspicuous. *Carpels* semi-terete; primary and secondary ridges cellular, hollow, almost covering the carpel, smooth; vittæ about 8 (excluding those on the commissure); carpophore 2-partite. *Seed* $\frac{1}{2}$-terete, dorsally subcompressed, slightly grooved on the inner face.

SUBGEN. **Pentazygon.** *Fruit* narrowed upwards or truncate; calyx-margin not prominent; ridges of the carpel 5, simple inflated rugose or tubercled, secondary wanting.

2. **T. Roylei,** *Lindl. in Royle Ill.* 232; radical leaves 2- sub-3-pinnate ultimate segments lanceolate-linear, ridges tubercled. *Dcne. in Jacq. Voy. Bot.* 67, t. 79.

WEST TIBET; *Falconer.* NORTH-WEST HIMALAYA; *Lance*; Lanjar, alt. 17,500 ft., *Strachey & Winterbottom.* KASHMIR; alt. 11,000–14,000 ft.; in many places, *C. B. Clarke.*

Stem 0–2 in., thick, grooved, often hollow. Radical *leaves* 3 in. (including petiole), oblong-lanceolate. *Umbel* solitary, sessile, with some of the rays (peduncles of single umbels?) again umbelled; bracts leaf-like; bracteoles 6–10, 1–2-pinnate, with lanceolate acute ultimate segments, often white-membranous on the margin. *Fruit* $\frac{1}{8}$–$\frac{1}{5}$ in., ellipsoid, narrowed upwards; primary ridges inflated, spongy, of cellular tissue, nearly covering the carpel, glistening when very young, then rugulose, lax, finally tubercled; vittæ usually 2 between the primary ridges. *Seed* $\frac{1}{2}$-terete, dorsally subcompressed, subpentagonal.

3. **T. dissectum,** *C. B. Clarke*; radical leaves 2-pinnate, secondary pinnæ pinnatifid glabrous ultimate segments small linear acute, fruit small ovoid truncate, ridges narrow not rugose.—Cortia, sp. 3, *Herb. Ind. Or. H. f. & T.*

SIKKIM; Tungu, alt. 13,000–14,000 ft. *J. D. H.*

Stem 0–7 in., not thickened. *Peduncles* 1–4 in.; bracts linear-oblong, pinnatifid, segments lanceolate-linear acute; bracteoles pinnate with narrow acute segments; primary rays $\frac{1}{2}$–1$\frac{1}{2}$ in. *Style*-bases prominent in the young fruit. *Fruit* $\frac{1}{12}$ in., slightly narrowed upwards; pericarp thin, slightly inflated; ridges hollow, much narrower than in the preceding species, furrows nearly covering the fruit, vittæ 1–2 in each furrow. *Carpophore* slender, 2-partite. *Seed* lunate, dorsally compressed.

4. **T. hirsutulum,** *C. B. Clarke*; radical leaves 2-pinnate, secondary pinnæ pinnatifid hirsute ultimate segments small linear acute, fruit small ovoid truncate ridges narrow not rugose.

SIKKIM; Tungu, alt. 13,000–14,000 ft., *J. D. H.*

Stem 0, crown greatly thickened. *Leaves* with ascending fine hairs on the midrib. *Umbel* solitary, sessile, with some of the rays again umbelled. *Bracteoles*, 3–6, $\frac{1}{2}$–1 in., 3-fid or pinnatifid. *Carpophore* stout, 2-fid. *Fruit* nearly as of *T. dissectum*, but the ridges less acute, the style-bases less prominent.

5. **T. obtusiusculum,** *C. B. Clarke*; cauline leaves pinnate pinnæ pinnatifid ultimate segments lanceolate subacute, fruit ovoid-oblong narrowed upwards, ridges narrow undulated not rugose. Ligusticum obtusiusculum, *Wall. Cat.* 543. Hymenolæna obtusiuscula, *DC. Prodr.* iv. 246.—Trachypodium sp. 3, *Herb. Ind. Or. H. f. & T.*

NIPAL, Gossain Than; *Wallich.* SIKKIM, alt. 11,000–13,000 ft.; Tungu, Lachen, Jongri; *J. D. H.*; *C. B. Clarke.*

Stem (including the terminal peduncle) often 1 foot, grooved, hollow. Radical *leaves* (including the petiole) 3–4 by 1 in., in Sikkim examples twice as large as Nipal ones; pinnæ 7–11, segments oblong toothed or lobulate. *Bracts* of a dilated narrow oblong entire petiole and sub-bipinnate limb with narrow remote segments in Sikkim examples, ovate pinnatifid with approximate broad lanceolate segments in Nipal ones. *Fruit* $\frac{1}{8}$ in.; style-bases conical, prominent; primary ridges lax; pericarp thin, somewhat inflated; vittæ usually 2 between the primary ridges; carpophore 2-fid. *Seed* semiterete, dorsally subcompressed, hardly concave on the inner face.

VAR. *stricta*; ultimate segments and bracts more acuminate, primary rays shorter, fruit more truncate less narrowed upwards. Trachydium, sp. 6. *Herb. Ind. Or. H. f. & T.*—Sikkim, Chola Pass, alt. 10,000–12,000 ft., *J. D. H.* This may be a distinct species. *Stems* very erect, rays of the umbel 1–1$\frac{1}{2}$ in., not much divaricate; but the only distinction of importance is in the fruit which, though not well ripened, is unlike that of *T. obtusiusculum* at the same stage.

6. **ELÆOSTICTA,** *Fenzl.*

Annual *herbs*, glabrous, erect, corymbose upwards or simple. *Leaves* 1–3-pinnate, ultimate segments linear. *Umbels* compound; bracts and bracteoles several, scarious. *Calyx-teeth* 0. *Petals* obovate, emarginate. *Disc* depressed, inconspicuous. *Styles* short. *Fruit* elliptic, truncate, laterally compressed, didymous; primary ridges very slender or 0, vittæ in each furrow 3–1, minute; carpophore 2-partite or entire. *Seed* lunate, margins incurved, hence broadly grooved on the inner face.—DISTRIB. Species 4, in Western and Central Asia.

This genus is placed by Bentham (*Gen. Pl.* i. 896) under *Conopodium*, but differs in the short truncate fruit, the deeply grooved seed, and scarious bracts.

1. **E. meifolia,** *Fenzl in Flora* 1843, 458; bracts 5–6 lanceolate, bracteoles similar but smaller, fruit broader than long. Scaligeria meifolia, *Boiss. Fl. Orient.* ii. 887. S. elata, *Boiss. & Haussk.*; *Boiss. l. c.* Butinia libanotica, *Boiss. in Ann. Sc. Nat.* ser. 3, ii. 62.

PUNJAB PLAIN; *Aitcheson.*—DISTRIB. Persia, Syria.

Root fusiform. *Stem* 1–3 ft., erect, panicled upwards or (in the small Indian example) simple. Rays of the *umbel* 5–11, $\frac{3}{4}$–1$\frac{1}{2}$ in. *Pedicels* 6–12, $\frac{1}{6}$ in., *Fruit* $\frac{1}{10}$ by $\frac{1}{12}$ in., depressed didymous; ridges obsolete; vittæ minute, 2–1 in each furrow. —The Indian solitary example may be a new species, but is more probably only a small specimen; the fruit is even smaller than in *E. meifolia* type, the carpophore subentire.

7. BUPLEURUM, *Linn.*

Glabrous *herbs*, or shrubs. *Leaves* entire. *Umbels* compound; bracts and bracteoles foliaceous, or setaceous, or 0. *Flowers* yellow or lurid, pedicelled or subsessile. *Calyx-teeth* 0. *Petals* obovate, emarginate. *Styles* short. *Fruit* laterally compressed, slightly constricted at the commissure; carpels terete or subpentagonal; primary ridges distinct, sometimes subalate, rarely obscure; secondary 0, or obscure; vittæ 1–3 between the primary ridges, rarely 0 or many; carpophore entire 2-fid or 2-partite. *Disc* depressed, rarely prominent in fruit. *Seed* terete, sometimes slightly grooved on the inner face.—DISTRIB. Species 60, European and temperate Asiatic: 1 South African, 1 Arctic American.

A genus at once recognised by its absolutely entire leaves.

1. **B. plantaginifolium,** *Wight Ic.* t. 281; upper cauline leaves broadly oblong obtuse mucronate, bracts 3–5 elliptic foliaceous, fruit $\frac{1}{3}$ in. oblong subquadrate subalate, furrows 1-vittate.

Mts. of the DECCAN PENINSULA; Nilghiris, alt. 6000–8000 ft., *Wight*, &c.

Stout, bushy, 2–7 ft. Lower *leaves* linear-oblong; upper cauline 2–4 by $\frac{3}{4}$–$1\frac{1}{4}$ in., subsessile, shortly narrowed at the base; nerves 10–30, subpalmate; secondary numerous, distinct, reticulate. *Bracts* $\frac{1}{3}$–1 in., subequal; bracteoles 4–5, $\frac{1}{4}$–$\frac{1}{2}$ in., oblong-elliptic, mucronate; rays 6–12, grooved; pedicels 4–12, shorter than the fruit. *Carpels* strongly pentagonal; ridges thick, obtuse, suborbicular, corky; furrows glaucescent, vittæ very large; carpophore 2-fid, often 2-partite. *Seed* subterete, deeply but obtusely 5-ridged.

2. **B. lanceolatum,** *Wall. Cat.* 551; middle cauline leaves petioled ovate or broadly lanceolate, bract 1 small lanceolate or 0, fruit ovoid-oblong, ridges obscure, furrows 3-vittate. *DC. Prodr.* iv. 132.

NORTH-WEST HIMALAYA; from KASHMIR to NIPAL, alt. 4000–9000 ft., common.

Perennial, 1–5 ft., erect, nearly simple, or sometimes subpanicled with spreading horizontal branches 1 foot long. Lower *leaves* long-petioled, lanceolate; middle cauline 3–5 by $\frac{1}{4}$–3 in., ovate, acuminate, occasionally rounded at the base, nerves 5–7, subpalmate; secondary nerves numerous, distinct, reticulate. *Bracts* $\frac{1}{4}$ in., acute; bracteoles less than $\frac{1}{8}$ in., linear, usually obsolete in the fruit; rays 5–8, unequal; pedicels 6–12, $\frac{1}{8}$ in., subequal. *Fruit* $\frac{1}{6}$–$\frac{1}{5}$ in. *Carpels* much incurved when ripe, yellowish-brown, subviscid; ridges distinct in imperfectly ripe fruit, small obsolete in the fully ripe; carpophore entire. *Seed* terete.

3. **B. Candollii,** *Wall. Cat.* 552; upper cauline leaves subsessile oblong or ovate hardly cordate lower linear-oblong, bracteoles 4–5 elliptic or oblong usually as long as the flowering umbellule, fruit ellipsoid-oblong, ridges prominent, furrows 3-vittate. *DC. Prodr.* iv. 131.

HIMALAYA, from KASHMIR to SIKKIM, alt. 8000–12,000 ft.; frequent.

Perennial, 1–3 ft., erect: more or less corymbose upwards. Lower cauline *leaves* 2–5 by $\frac{1}{8}$–$\frac{1}{2}$ in.; upper 1–4 by $\frac{1}{4}$–$\frac{3}{4}$ in., acute, rarely acuminate, narrowed shortly at the base, subsessile or sessile and amplexicaul; primary nerves 8–12, often subpinnate, oblique; transverse nerves numerous, distinct, reticulating. *Bracts* 2–3 or 0, $\frac{1}{4}$–$1\frac{1}{4}$ in., ovate or oblong, acute, foliaceous, angular; bracteoles $\frac{1}{6}$–$\frac{1}{3}$ in., foliaceous, frequently longer than the fruiting umbellule; rays 5–8, rather short; pedicels about half as long as the carpels. *Carpels* $\frac{1}{8}$ in., yellowish-brown, semi-terete or dorsally subcompressed; ridges distinct, but not thick nor winged; carpophore entire.

Seed nearly terete.—The Kashmir and Chumba examples are much more slender than the Sikkim.

4. **B. jucundum,** *Kurz in Seem. Journ. Bot.* 1867, 240; lower cauline leaves short-petioled obovate upper ovate amplexicaul deeply cordate, bracteoles 4–5 oblong acute usually shorter than the umbellule, fruit elliptic-oblong, ridges prominent, furrows 3-vittate. B. sachinalense, *F. Schmidt Reis. Amurlande,* 135. B. heterophyllum, *Jacquem. mss.* (not of Link).

KASHMIR; Budrawur, alt. 7000 ft., *C. B. Clarke.* LAHUL; *Jaeschke.*—DISTRIB. Amurland.

Stems 1–2 ft., erect from a decumbent base, corymbose with long branches. Lower cauline *leaves* 1–1½ in., orbicular, petiole scarcely ⅛ in.; upper 1–2 in., orbicular or ovate-oblong, mucronate, not peltate; primary nerves 10–20, palmate; transverse nerves numerous, distinct, oblique, reticulating. *Bract* 1, ¼–¾ in., ovate, foliaceous, often amplexicaul or cordate, occasionally 0; bracteoles 4–5, usually ⅙ in., often 0; rays 5–8, somewhat stout, angular; pedicels about half as long as the carpels. *Carpels* nearly as in *B. Candollii,* but rather longer, ⅙ in.—*B. aureum, Fisch.,* differs in the much larger bracteoles, and the often perfoliate upper leaves.

VAR. *cachemirica;* lower cauline leaves linear-oblong or linear, upper ovate-lanceolate, ridges subalate.—Kashmir, alt. 7500–10,000 ft., *C. B. Clarke;* common. Lower cauline leaves 5 by ⅓ in. Bracts often 0; bracteoles of 1–4 oblong or linear frequently 0.—The extreme forms of this with tall simple stem corymbose near the summit, narrow leaves, and umbels nearly without bracts or bracteoles appear very distinct from *B. jucundum,* but there are numerous intermediate forms.

5. **B. Thomsoni,** *C. B. Clarke;* cauline leaves linear upper lanceolate or ovate cordate-amplexicaul, bracteoles 5–9 lanceolate acuminate or linear, carpels glaucous 5-winged, furrows 4–3-vittate.

KASHMIR; Sonamurg, alt. 9250 ft., *C. B. Clarke.* NORTH-WEST HIMALAYA, alt. 7000–9000 ft., *T. Thomson.*

Erect, 2–3 ft., corymbose. Upper cauline *leaves* 2–4 in., lanceolate, acuminate, uppermost sometimes ovate, transverse reticulating nerves obscure. *Bracts* usually 0, sometimes 1–2 lanceolate: rays of the umbel 6–10, 1–2½ in.; bracteoles usually as long as the flowering umbellules, caudate; rays of the umbellule often 20, about half as long as the mericarp. *Fruit* ⅕ in., oblong, subquadrate; carpels terete, wings more than half as broad as the nucleus; carpophore very thin, 2-partite.—This has been supposed to be allied to *B. diversifolium;* but the foliage seems nearer that of *B. jucundum,* var. *cachemirica;* it should be compared with *B. polyphyllum, Ledeb.; Boiss. Fl. Orient.* ii. 851, of which no authentic example is at Kew.

6. **B. diversifolium,** *Rochel Pl. Ban.* 68, t. 28, fig. 57; upper cauline leaves lanceolate caudate base ovate amplexicaul scarcely cordate, bracteoles 5–8 narrow-lanceolate acuminate shorter than the fruiting umbellules, ridges distinct, furrows 3-vittate. *Reich. Ic. Pl. Germ.* t. 1885.

NORTH-WEST HIMALAYA, alt. 7000–9000 ft., *Thomson.* KASHMIR and BALTISTAN, alt. 9000–12,000 ft., *C. B. Clarke.*—DISTRIB. West Asia, South-East Europe.

Lower cauline *leaves* linear, hardly broader upwards; middle cauline completely amplexicaul. *Bracts* 0, or 1, small, lanceolate: rays of the umbel 8–14; pedicels ⅛–¼ in. *Fruit* ⅙ in. glaucous, in outline oblong; disc brown, subprominent.—United with *B. falcatum,* Linn. both by Reichenbach l. c. and in *Boiss. Fl. Orient.* ii. 850: it differs in the completely amplexicaul, usually inflated, base of the cauline leaves, the lower leaves linear not at all obovate, the fruits glaucous much more strongly ribbed. Whether regarded as a species or variety, India produces the plant of Rochel in its most characteristic form.

7. **B. falcatum,** *Linn.*; *DC. Prodr.* iv. 132; radical leaves linear broader upwards middle cauline linear acute narrowed at the base more or less amplexicaul, bracts 1–5 lanceolate small or 0, bracteoles 4–5 distinctly shorter than the fruiting umbellule, carpels narrowly oblong, ridges not prominent, furrows 3-vittate. *Jacq. Fl. Austr.* t. 158; *Boiss. Fl. Orient.* i. 850. B. imaicolum, *A. Kerner Nov. Sp. Pl. dec.* ii. 19.

HIMALAYA; alt. 3000–12,000 ft., from KASHMIR to BHOTAN, frequent. KHASIA MTS.; alt. 3000–6000 ft., frequent.—DISTRIB. Central and W. Asia, S. Europe.

Stem 1–4 ft., erect, corymbose upwards. Radical *leaves* spathulate-oblong in the typical European specimens, in the Indian (which belong to the form *B. gramineum* Vill.) they are but slightly broader upwards. Cauline *leaves* $\frac{1}{2}$-amplexicaul or sessile, long acuminate, secondary nerves not prominent. *Bracts* usually 0 in the Indian forms, sometimes a few scarcely $\frac{1}{4}$ in.; bracteoles usually not longer than the flowering umbellule, narrowly lanceolate; rays 5–8, $1\frac{1}{2}$ in.; pedicels 5–15, usually less than half the length of the fruit. *Fruit* $\frac{1}{5}$–$\frac{1}{6}$ in., brown; carpels terete, ridges distinct; disc yellow or brownish, not prominent.

VAR. 1. *marginata*, Wall. Cat. 566 (sp.); margins of the leaves prominently cartilaginous. *DC. Prodr.* iv. 132.—Himalaya and Khasia Mts.; the most frequent form.—Middle cauline leaves often completely amplexicaul, but narrowed not widened close to the base.

VAR. 2. *Hoffmeisteri*, Klotzsch in Reis. Pr. Waldem. Bot. 146, t. 52 (sp.); cauline leaves numerous less acuminate scarcely at all amplexicaul, carpels $\frac{1}{5}$ in. glaucous, ridges very prominent.—Kashmir, alt. 8000 ft., *C. B. Clarke*; *Falconer.*—*Leaves* somewhat suddenly acute, mucronate, glaucous, primary nerves strong, secondary subprominent.

VAR. 3. *nigrocarpa*, Jacquem. ms. (sp.); stems numerous from the crown, often procumbent, cauline leaves ovate-lanceolate or linear widest very near the amplexicaul base, bracts 3–4, $\frac{1}{2}$ in. lanceolate-linear, disc prominent on the half ripe fruit purple-black. B. virgatum, *Wall. Cat.* 555 *not of W. & A.* B. gracillimum, *Klotzsch in Reis. Pr. Waldem. Bot.* 148, t. 50 (*sp.*)—Baltistan, Kashmir, and N.W. Himalaya; alt. 10,000–14,000 ft. frequent. Sikkim; Yakla alt. 10,000 ft., *C. B. Clarke.*—This has all the appearance of an alpine variety of *B. falcatum.* The leaves vary a good deal in width; the lower always linear, the uppermost sometimes ovate. In habit it agrees with an authentic example of *B. baldense*, var. *æneum*, *Boiss. Fl. Orient.* ii. 849, but the leaves seem never oblong.

8. **B. mucronatum,** *W. & A. Prodr.* 370; cauline leaves linear or linear-oblong mucronate often subobtuse narrowed at the base, bracts 4–5 lanceolate prominent, carpels elliptic, ridges prominent, furrows 2-1- (rarely 3-) vittate. B. ramosissimum, *W. & A. Prodr.* 370; *Wight Ic.* t. 1007. B. falcatum, Var. ramosissimum, *Dalz. & Gibs. Bomb. Fl.* 108. B. virgatum, *W. & A. Prodr.* 370, *not of Wall.* B. nervosum, *Moon Cat.* 22.

MTS. of the SOUTH DECCAN and CEYLON; alt. 5000–8000 ft.; plentiful.

Differs essentially from *B. falcatum, Linn.* in the fruit being elliptic instead of oblong, shorter, and narrowed at the apex. Also there are invariably present 4 or 5 bracts, often $\frac{1}{2}$–$\frac{3}{4}$ in., the bracteoles are more prominent usually exceeding the flowering umbellules, and the upper cauline leaves are less acuminate. W. & A. have distinguished three forms as under:

VAR. 1 *typica*; stem little branched, upper leaves linear-oblong obtuse mucronate, bracteoles sometimes exceeding the fruiting umbellules, carpels strongly ridged, furrows usually with solitary large vittæ.—South Deccan.

VAR. 2. *ramosissima*, W. & A. l. c. (sp.); stem corymbose upwards, leaves less obtuse, bracteoles about as long as the flowering umbellules, carpels distinctly ridged, furrows usually 2-vittate.—South Deccan.

VAR. 3. *virgata*, W. & A. l. c. (sp.); habit nearly of *B. falcata* but the fruit very markedly ellipsoid, often only $\frac{1}{8}$ in. long and nearly as broad, ridges not very promi-

nent, furrows usually 3-vittate.—Ceylon.—*Stem* usually simple, erect, laxly corymbose above, cauline leaves subacute.—It is the existence of this var. that has led to the referring the South Indian species to *B. falcatum.* This Ceylon plant differs from the Himalayan *B. falcatum* not only in the shortened fruit but in the invariable presence of 4–5 bracts.

9. **B. distichophyllum,** *W. & A. Prodr.* 370; lower cauline leaves distichous bases closely imbricate sheathing, upper linear broadest at the base, fruit elliptic, ridges distinct, furrows generally 1-vittate. *Wight Ic.* t. 1006.

NILGHIRI MTS., alt. 7000 ft.; *Wight,* &c.

Stem 4–14 in., slender, erect; otherwise closely resembling *B. mucronatum* from which it differs chiefly in the very small fruits ($\frac{1}{12}$ in.). The lower distichous leaves are in the typical examples very closely packed, 12–16 in the space of 1 in.; but when these are absent it is difficult to distinguish from small examples of *B. mucronatum.*

10. **B. longicaule,** *Wall. Cat.* 557; lower cauline leaves linear or lanceolate acute upper often wider at the base, bracteoles 5–8 elliptic-acuminate foliaceous longer than the flowering umbellule, fruit oblong, ridges subalate, furrows 3-vittate. *DC. Prodr.* iv. 131. B. rupestre, *Edgw. in Trans. Linn. Soc.* xx. 52.

HIMALAYA, alt. 8–13,000 ft.; from KASHMIR to SIKKIM; common.

Stem 8–24 in., erect, corymbose upwards; sometimes branching from the root. *Leaves* very variable; in the Wallichian type narrow-linear acute, the uppermost (and the bracts) little wider, hardly broader at the base, transverse nerves not prominent; in other examples upper leaves (as the bracts) ovate, acute, with very prominent secondary nerves. *Bracts* 1–3; bracteoles 5–8, very prominent, with reticulating nerves, often longer than the fruiting umbellule; rays 3–8, 1–2½ in., somewhat stout, striate. *Petals* and *disc* usually black. *Fruit* $\frac{1}{8}$–$\frac{1}{6}$ in.

VAR. 1. *himalensis,* Klotzsch in Reis. Pr. Waldem. Bot. 146, t. 51 (sp.); upper leaves ovate-lanceolate base amplexicaul ovate almost cordate, bracteoles 8–10 very broad imbricate.—Kashmir, alt. 12,000 ft., frequent.—Connected by imperceptible gradations with the Eastern plant.

VAR. 2. *Dalhousieana*; upper leaves and bracts ovate-lanceolate narrowed at the base, petals yellow, disc brown, fruit stongly ridged hardly winged usually thrice as long as the pedicel.—Dalhousie and Dhurmsala, alt. 8000–12,000 ft.; plentiful, *C. B. Clarke.*—Stems 4–8 in., sometimes erect 24 in., much divided or simple, corymbose at the top. Upper leaves and bracts with the transverse nerves obscure. *Bracteoles* smaller than in typical *B. longicaule,* less acuminate, and much less foliaceous, the transverse nerves far less prominent.—The true affinity of this form is very doubtful: it differs from *B. Candollii* in the cauline leaves being narrower with obscure secondary nerves, and by having all the leaves more acute: from *B. tenue* in the acute leaves, stout rays of the umbel, and much stronger umbellules.

VAR. 3. *stricta*; stems 12–15 in. usually simple terminated by a strict umbel, bracts and bracteoles elliptic-oblong hardly acute pendent in fruit.—Sikkim; Jongri, alt. 12,000–13,000 ft., *C. B. Clarke.* Stem very erect. Lower leaves linear, upper rather broader, all narrowed at the base. Bracts several, sometimes nearly 2 in.; bracteoles orbicular or oblong, sometimes ¾ in., longer than the fruiting umbellule; rays of the umbel stout, ascending not divaricate. *Fruit* longer than in any form of *B. longicaule,* sometimes $\frac{1}{5}$ in.—This is almost surely allied to Var. *Dalhousieana*: but it may be doubted whether it should be attached to *B. longicaule,* Wall.

11. **B. tenue,** *Don Prodr.* 182; upper leaves linear-oblong subobtuse mucronate narrowed at the base, bracts and bracteoles not prominent, primary rays of the umbel slender, fruit $\frac{1}{10}$–$\frac{1}{8}$ in., ridges prominent, furrows 1-vittate. *Wall. Cat.* 553; *DC. Prodr.* iv. 128. B. flexuosum, *Wall. Cat.* 554.

HIMALAYA; from KASHMIR to SIKKIM, alt. 1–9000 ft.; common in the West, and in the lower hills, extending in the plains to Jullundur.

Stem 1–3 ft., solitary, erect, much branched upwards, usually with numerous umbels. Lower *leaves* linear; oblong leaves usually with 5–9 somewhat distant primary nerves and numerous prominent reticulating secondary ones. *Bracts* 1–4, $\frac{1}{8}$–$\frac{1}{3}$ in., lanceolate or obovate-lanceolate; bracteoles 4–5, $\frac{1}{6}$ in., obovate-lanceolate, often as long as the fruiting umbellule or longer; rays 3–8, usually less than 1 in., never stout; pedicels rarely exceeding $\frac{1}{20}$ in. *Fruit* broadly oblong, yellowish brown; carpels terete; vittæ in each furrow solitary, sometimes obscure.—Distinguished from *B. Candollii Var. minor* by the delicate primary rays of the umbel and the much smaller fruit.

VAR. *khasiana*; upper leaves linear or lanceolate acute or acuminate, bracts and bracteoles narrow-lanceolate prominent, fruit rather longer.—Khasia Mts., alt. 4000–6000 ft.; common; Tenasserim; Martaban Hills, alt. 7000 ft., *Kurz.*—Stem often very bushy from the base, corymbosely dichotomous with ascending branches, whereas in *B. tenue* type there is a simple main stem with divaricate sub-horizontal branches. Bracts often $\frac{3}{4}$ in.; bracteoles overtopping the fruits.—This variety has always been referred to *B. tenue*, Don, with which the fruit closely agrees; it resembles *B. mucronatum*, var. *ramosissima* in its leaves bracts and bracteoles, but differs in its smaller, shorter pedicelled fruit. We have not seen Martaban specimens, but as Kurz (Journ. As. Soc. 1877, pt. ii. 114) gives *tenue*, Don, as a native, we assume he alludes to this variety.

12. **B. Maddeni,** *C. B. Clarke*; cauline leaves small linear acuminate narrowed at the base, bracteoles few not prominent, pedicels less than $\frac{1}{20}$ in., fruit $\frac{1}{8}$ in. oblong strongly ridged, furrows 2–3-vittate.—Bupleurum No. 8, *Herb. Ind. Or. H. f. & T.*

NORTH-WEST HIMALAYA; Mussoorie, *Madden, Jameson*; Simla, *Lady Dalhousie*; Kunawur, alt. 6000–8000 ft., *Thomson.*

Stems 1–2 ft., several from the root, erect, simple below, with numerous leafy branches upwards. Lower *leaves* linear, almost subulate; upper $\frac{1}{2}$–$1\frac{1}{2}$ in., scarcely amplexicaul. *Bracts* 1–3, $\frac{1}{8}$ in., lanceolate, often 0; bracteoles 3, less often 4–5, $\frac{1}{8}$ in., lanceolate or linear, rays 5–8, less than $\frac{2}{3}$ in. *Fruit* broadly oblong, glaucous. —Thomson regarded this as a new species near *B. tenue*, with which it agrees in having very small umbels with subsessile flowers, but it seems more closely allied to *B. falcatum*, var. *Hoffmeisteri*, of which it may possibly be a depauperated mountain form.

13. **B. setaceum,** *Fenzl in Tchih. As. Min.* i. 418; stem slender diffusely dichotomously branched, leaves setaceous, umbels simple few-flowered subracemed with capillary peduncles, fruit $\frac{1}{10}$ in. ellipsoid, ridges distinct, furrows 1-vittate. *Boiss. Fl. Orient.* ii. 847.

KASHMIR, alt. 4500 ft.; Kishtwar, *C. B. Clarke*; *Stewart.*—DISTRIB. Bithynia.

Annual. *Stem* 18 in., erect, above divaricately branched. Cauline *leaves* 1–$1\frac{1}{2}$ in., uppermost $\frac{1}{4}$ in., setaceous, 3-nerved. *Peduncles* $\frac{1}{4}$–$1\frac{1}{4}$ in., usually springing as though from a bifurcation whereof one branch is arrested. *Bracts* 1–4, $\frac{1}{8}$–$\frac{1}{6}$ in., narrowly linear-lanceolate, usually longer than the fruiting umbel; pedicels 1–4, less than $\frac{1}{24}$ in. *Fruit* obscurely transversely rugose between the ridges; vittæ large, distinct, alternating with the ridges; carpels terete, slightly pentagonal.—Identified with *B. setaceum* from Fenzl's description only. There are several closely allied species perhaps not really distinct: *B. trichopodum, Boiss. & Sprun.* (*Boiss. Fl. Orient.* ii. 864) is much less compound, and the fruits have the furrows 3-vittate.

8. **APIUM,** *Linn.*

Herbs, annual or perennial, glabrous. *Leaves* pinnate, 3-partite, or compound. *Umbels* compound, often leaf-opposed. *Bracts* and bracteoles 0 (in the Indian species). *Flowers* white. *Calyx-teeth* obsolete. *Petals* ovate, acute,

tip inflexed. *Fruit* orbicular or elliptic, slightly longer than broad, laterally subcompressed; carpels semi-terete, subpentagonal, plane on the inner face; primary ridges distinct, filiform; secondary 0; furrows 1-vittate; carpophore undivided, or shortly 2-fid. *Seed* semi-terete, dorsally subcompressed.—DISTRIB. Species 14, scattered throughout the world.

The genus is hardly separable from *Carum*; the one Indian species is easily recognized by its short-peduncled umbels opposite a leaf without bracts or bracteoles.

1. **A. graveolens,** *Linn.*; *DC. Prodr.* iv. 101; radical leaves pinnate with large deeply lobed segments, cauline 3-partite, segments once or twice trifid coarsely toothed. *Wall. Cat.* 7212; *W. & A. Prodr.* 367; *Boiss. Fl. Orient.* ii. 856.

Base of the NORTH-WEST HIMALAYA, and outlying hills in the PUNJAB; *Falconer, Jacquemont*, &c.—DISTRIB. Cabul, West Asia, Europe, North Africa.

Biennial. *Stem* 1–8 ft., erect, branched. *Peduncle* 0–$\frac{1}{4}$ in., leaf-opposed: rays of the umbel 5–10, $\frac{1}{2}$–1$\frac{1}{2}$ in.; pedicels 6–16, $\frac{1}{24}$–$\frac{1}{8}$ in. *Fruit* $\frac{1}{16}$–$\frac{1}{12}$ in.; ridges narrow, vittæ broad, occupying the whole breadth of the furrows.—Wild celery.

9. **CICUTA,** *Linn.*

Herbs, perennial, tall, glabrous. *Leaves* usually compound-pinnate. *Umbels* compound, rays numerous. *Bracts* 0, or few; bracteoles many, small. *Flowers* white. *Calyx-teeth* acute, minute. *Petals* obovate, emarginate. *Fruit* ovoid, not longer than broad, subcompressed, distinctly narrowed at the commissure; carpels semi-terete, dorsally compressed, plane on the inner face; primary ridges broad, corky, obtuse; furrows very narrow, 1-vittate; carpophore 2-partite. *Seed* semi-terete, dorsally compressed.—DISTRIB. Species 3, in the North Temperate Zone.

1. **C. virosa,** *Linn.*; *DC. Prodr.* iv. 99; cauline leaves 2–3-pinnate, segments lanceolate serrate. *Engl. Bot.* t. 479; *Reich. Ic. Fl. Germ.* t. 1853. Cicutaria aquatica, *Lamk. Dict.* ii. 2, *Ill.* t. 195.

KASHMIR; *Falconer*; Srinuggur, alt. 5200 ft., *C. B. Clarke.*—DISTRIB. Throughout Europe and Temperate Asia; in marshes and ditches.

Stem 2–5 ft., striate, hollow. *Leaflets* 1–2 by $\frac{1}{8}$–$\frac{1}{3}$ in. *Peduncles* 2–3 in., terminal and leaf-opposed. *Bracts* 0; bracteoles 2–8, $\frac{1}{3}$ in., linear or narrowly lanceolate-linear; rays often 15, 1$\frac{1}{2}$–2$\frac{1}{2}$ in.; pedicels often 30–40, $\frac{1}{4}$–$\frac{1}{3}$ in. *Fruit* $\frac{1}{16}$ in. in Indian examples (often $\frac{1}{12}$ in. in European), lateral primary ridges commissural; commissure obscurely constricted in some Indian examples.—Water hemlock.

10. **PITURANTHOS,** *Viv.*

Perennial *herbs*, branched, somewhat rigid. Radical *leaves* 2–3-pinnate, cauline much reduced. *Umbels* compound; bracts and bracteoles lanceolate-linear, small, or 0. *Calyx-teeth* obsolete. *Petals* white, ovate, emarginate. *Fruit* ovoid or oblong, more or less laterally compressed, usually hairy; carpels terete, subpentagonal; primary ridges distinct (when the hair is removed), obtuse; furrows 1-vittate; carpophore 2-partite.—DISTRIB. Species 5 African, 2 Indian.

SUBGEN. **Eriocycla.** *Lindley* (Gen.). *Stem* and *leaves* pubescent. *Disc* conical, very prominent. *Styles* long, early divergent, recurved. *Ovary* and young *fruit* densely hairy. *Fruit* oblong, much longer than broad.

1. **P. nuda,** *Benth. in Gen. Pl.* i. 890; much branched upwards with virgate almost naked branches, umbels long-peduncled, rays 3–6, fruit scarcely laterally compressed. Eriocycla nuda, *Lindl. in Royle Ill.* 232, t. 51.

NORTH-WEST HIMALAYA; Kunawur, alt. 10,000–11,000 ft., *Royle, T. Thomson*; *Jacquemont.*

Stem 2–3 ft., glabrescent upwards. Lower cauline *leaves* 2-pinnate, ultimate segments $\frac{1}{2}$ in., oblong, lobed and toothed; upper much reduced, often to oblong acute sheaths $\frac{1}{2}$ in. *Bracts* 1–5, $\frac{1}{4}$ in; bracteoles 5–10, $\frac{1}{12}$–$\frac{1}{4}$ in., linear; rays 1–4 in.; pedicels 8–12, $\frac{1}{12}$–$\frac{1}{4}$ in., obscurely pubescent. *Fruit* $\frac{1}{6}$ in., at first densely hairy, ultimately much less so; carpels oblong, narrower upwards; lateral primary ridges marginal.

2. **P. Thomsoni,** *C. B. Clarke*; stem with many lateral branches and umbels, rays 4–8, fruit much laterally compressed.—Eriocycla sp. ? 2, *Herb. Ind. Or. H. f. & T.*

WEST TIBET; Piti, alt. 10,000–12,000 ft., *Thomson.* HIMALAYA; *Jacquemont.*

Stem 12–18 in., grey-pubescent. Lower cauline *leaves* 2-pinnate; ultimate segments $\frac{3}{4}$ in., ovate, deeply pinnatifid, toothed; upper leaves greatly reduced. *Umbels* long- or short-peduncled, sometimes sessile; bracts 4–8, $\frac{1}{3}$ in., linear; rays $\frac{1}{2}$–$1\frac{1}{2}$ in., pubescent, subtomentose; bracteoles and pedicels much as in *P. nuda,* but more hairy. *Fruit* $\frac{1}{8}$ in.; carpels oblong, hardly narrowed upwards; lateral primary ridges within the distinctly constricted commissure.

11. CARUM, *Linn.*

Herbs, perennial or annual. *Leaves* pinnate, or decompound. *Umbels* compound; bracts few or many, simple or rarely divided; bracteoles several or many, undivided. *Flowers* white (in Indian species), polygamous, sterile flowers often with enlarged or irregular petals. *Calyx-teeth* small, or 0. *Petals* retuse or emarginate. *Fruit* ovoid ellipsoid or oblong, laterally compressed and more or less constricted at the commissure; carpels terete, subpentagonal, plane on the inner face; primary ridges slender, conspicuous or obscure, lateral commissural; furrows 1-vittate; carpophore 2-fid or 2-partite. *Seed* terete, dorsally subcompressed, plane or obscurely channelled on the inner face.—DISTRIB. Species 50 in Europe, Temperate Asia, S. Africa and N. America.

This genus as modelled by Mr. Bentham differs from *Pimpinella* in its solitary vittæ, from *Seseli* by the fruit being more or less constricted at the commissure. (See *Pimpinella cæspitosa* which has solitary vittæ.)

* *Fruit glabrous or very nearly so.*

1. **C. Carui,** *Linn.*; *DC. Prodr.* iv. 115; ultimate segments of the lower leaves lanceolate, of the upper linear, bracteoles small linear or 0, fruit elliptic-oblong. *Boiss. Fl. Orient.* ii. 879.

BALTISTAN, KASHMIR and GURWHAL, alt, 9000–12,000 ft., *Royle,* &c.—DISTRIB. W. and N. Asia, Europe (often cultivated).

Glabrous. *Stem* 1–3 ft., branched, erect or diffuse. *Leaves* 2-pinnate, finely dissected; ultimate segments of the lower leaves $\frac{1}{8}$–$\frac{1}{6}$ in., of the upper $\frac{1}{4}$–1 in. *Bracts* 1–3, small, linear, or 0, rarely divided; rays 3–8, $\frac{1}{4}$–2 in., unequal; pedicels 3–8,

$\frac{1}{20}$–$\frac{1}{2}$ in., unequal. *Fruit* $\frac{1}{8}$–$\frac{1}{6}$ in., yellowish-brown, almost viscid; carpels terete narrowed upwards, primary ridges thin but very distinct; vittæ solitary, rather large; carpophore entire, or shortly 2-fid.—C. meifolium, *Bieb. Boiss. Fl. Orient.* differs by its lower leaves with linear segments, its more numerous bracts; but is perhaps hardly distinguishable.—Caraway.

2. **C. ? diversifolium,** *C. B. Clarke*; upper leaves 3-partite, pinnæ narrow-oblong or linear entire, fruit elliptic-oblong prominently ridged. Sison diversifolium, *Wall. Cat.* 592. Falcaria? diversifolia, *DC. Prodr.* iv. 110.

NIPAL; *Wallich.*

Glabrous. *Stem* 3 ft. or more, much branched, sparingly leafy upwards, *Leaves* 2–3 in.; pinnæ $\frac{3}{4}$ by $\frac{1}{10}$ in., acute, or in the upper leaves often linear. *Bracts* 1–3, $\frac{1}{8}$ in. linear or 0; bracteoles 0–5, $\frac{1}{6}$ in., linear; rays 8–14; pedicels numerous. *Flowers* minute, all fertile. *Calyx-teeth* 0. *Petals* obovate, slightly emarginate. *Styles* somewhat long on conical style-bases. *Fruit* immature, $\frac{1}{8}$ in., nearly terete, probably resembling that of *C. Carui*, but may become broad at the commissure when it may be referable to *Fœniculum.*

3. **C. nothum,** *C. B. Clarke*; ultimate segments of all the leaves short linear, bracteoles 4–5 linear-oblong exceeding the pedicels, fruit nearly as in *C. Carui.*

CEYLON ? .

Glabrous. *Stem* 4–5 in., erect, branched. *Leaves* 2–3-pinnate, finely dissected; ultimate segments $\frac{1}{8}$ in., somewhat distant and rigid. *Bracts* 4–5, $\frac{1}{3}$ in., very narrowly oblong, subobtuse; rays 3–7, 1–1$\frac{1}{2}$ in.; pedicels 3–8, rarely attaining $\frac{1}{4}$ in. *Calyx-teeth* minute. *Fruit* rather more strongly ribbed than that of *C. Carui*, less narrowed upwards; carpophore 2-partite.—There is little doubt regarding the genus of this plant, it having been originally referred to *Ptychotis* by Sir J. D. H. and having been again dissected by Bentham and marked *Carum.* The doubt is as to its birth-place; it is marked "Ceylon," but not on an original ticket, and there is no collector's name. Its aspect is Alpine Himalayan, not at all Cinghalese. There is another small specimen collected by T. Lobb in Mysore that seems the same thing.

4. **C. Bulbocastanum,** *G. D. J. Koch in Nov. Act. Acad. Cæs. Leop.* 1825, 121; ultimate segments of all the leaves linear, bracteoles 0–8 linear, fruit oblong not narrowed upwards. *DC. Prodr.* iv. 115. Bunium Bulbocastanum, *Linn.*

KASHMIR, alt. 6000–9000 ft.; *Jacquemont*, &c.—DISTRIB. Beloochistan, N. Asia, Europe, N. Africa.

Glabrous. *Root* tuberous. *Stem* 6–30 in., erect, branched. *Leaves* 2–3-pinnate, finely dissected, ultimate segments of the lower often $\frac{1}{2}$–1 in., of the upper leaves very narrow. *Bracts* 0, or several, linear, sometimes divided; rays 6–16, 1$\frac{1}{2}$ in.; pedicels 10–15, $\frac{1}{8}$–$\frac{1}{2}$ in. *Fruit* $\frac{1}{8}$–$\frac{1}{6}$ in., yellowish-brown, almost viscid; carpels exactly oblong, hardly widened at the middle, semi-terete, dorsally subcompressed; ridges thin, distinct; vittæ solitary, rather large.

5. **C. stictocarpum,** *C. B. Clarke*; ultimate segments of the lower cauline leaves narrowly linear-lanceolate, bracteoles 4–8 linear-lanceolate with scarious ciliate margins, fruit shining minutely pubero-punctate.—Ptychotis sp. 3, *Herb. Ind. Or. H. f. & T.*

CONCAN; *Stocks, Law.*

Glabrous or minutely hairy. *Root* fusiform. *Stem* 1–3 ft., erect, much branched. *Leaves* 2-pinnate, ultimate segments often 1 by $\frac{1}{12}$ in., upper often with linear segments. *Bracts* 3–6, $\frac{1}{4}$–$\frac{1}{3}$ in., nearly linear: bracteoles $\frac{1}{4}$ in.; rays 6–12, $\frac{1}{2}$–2 in., equal, slender; pedicels 8–20, $\frac{1}{8}$–$\frac{1}{4}$ in. *Ovary* minutely pubero-pubescent. *Fruit*

$\frac{1}{24}$–$\frac{1}{16}$ in., ovoid, ultimately shining, yellow, the dots microscopical, ridges faint; carpels semi-terete; vittæ solitary, small.

VAR. *hebecarpa*; fruit $\frac{1}{16}$–$\frac{1}{12}$ in. hispidulous sometimes densely so and fuscous. Ptychotis sp. 4. *Herb. Ind. Or. H. f. & T.*—Concan; *Stocks, Law.*

** *Fruit hispid or muricate* (see also *C. stictocarpum* No. 4).

6. **C. Roxburghianum,** *Benth. in Gen. Pl.* i. 891; ultimate segments of the lower cauline leaves narrowly linear-lanceolate, bracteoles 4–8 linear-lanceolate with scarious ciliate margins, fruit hispid. *Kurz in Journ. As. Soc.* 1877, pt. ii. 114. Apium involucratum, *Roxb. Hort. Beng.* 22, *Fl. Ind.* ii. 97; *Fleming Cat. Ind. Med. Pl.* 6; *Wight Ic.* t. 567. Pimpinella ? involucrata, *W. & A. Prodr.* 369; *Wight Ic.* t. 335; *Dalz. & Gibs. Bomb. Fl.* 106. Athamantha Roxburghiana, *Wall. Cat.* 571. Ptychotis Roxburghiana, *DC. Prodr.* iv. 109.—Phellandrium sp., *Wall. Cat.* 7217, *fide W. & A.*

Throughout INDIA extensively cultivated from HINDOOSTAN and BENGAL to SINGAPORE and CEYLON. Not known wild.

Probably a cultivated form of *C. stictocarpum* which it exactly resembles except as to the fruit which is $\frac{1}{12}$–$\frac{1}{10}$ in., the part used by man and therefore that which has varied under cultivation. This shows a wide difference in size, colour, and hairiness in the two forms, but there is a series of connecting links through the var. *hebecarpa*. In *C. Roxburghianum*, the fruit is more distinctly ridged, subpentagonal; the vittæ are most minute, W. & A. say several in each furrow, but they appear generally 1 or 0. The petals are hairy.—Wight doubts whether his t. 567 (which is copied from Roxburgh) is the *Pimpinella ? involucrata* of W. & A. Prodr. 369; but a reference to his Herbarium shows that it is; the fruit varying somewhat in size and a good deal in hairiness. The only scrap Wight got of *C. stictocarpum* he arranged (without name) in *Ptychotis*.

7. **C. copticum,** *Benth. in Gen. Pl.* i. 891; ultimate segments of all the leaves linear, bracteoles 3–5 small linear, fruit muricate subhispid. Ammi copticum, *Boiss. Fl. Orient.* ii. 891. Ligusticum Ajawain, *Fleming Cat. Ind. Med. Pl.* 25. L. Ajouan, *Roxb. Hort. Beng.* 21, *Fl. Ind.* ii. 91. Athamantha Ajowan, *Wall. Cat.* 572. Ptychotis coptica, *DC. Prodr.* iv. 108. P. Ajowan, *DC. l. c.* 109; *W. & A. Prodr.* 368; *Wight. Ic.* t. 566. Bunium aromaticum, *Linn. Mant.* 218. Seseli ammoides, *Jacq. Hort. Vind.* t. 52. Sison Ammi, *Jacq. Hort. Vind.* t. 200.

INDIA, extensively cultivated from the PUNJAB and BENGAL to the SOUTH DECCAN.—DISTRIB. W. Asia, S. Europe, N.-E. Africa.

Minutely pubescent, or the stem and leaves glabrescent. *Root* fusiform. *Stem* 1–3 ft., erect, branched, leafy. *Leaves* 2–3-pinnate; ultimate segments linear, often $\frac{1}{2}$–1 in. *Bracts* several, linear, rarely 0, sometimes divided; rays 4–12, $\frac{1}{2}$–1$\frac{1}{2}$ in.; pedicels 6–16, $\frac{1}{20}$–$\frac{1}{4}$ in., more or less pubescent. *Fruit* $\frac{1}{12}$ in., ovoid; carpels subpentagonous, dorsally compressed, nearly plane on the inner face; ridges usually distinct; vittæ solitary, small.—The bracts are in the Indian Ajowan not rarely divided, when it is undistinguishable from the West Asian *C. copticum*. Boissier l. c. maintains that the genus should be *Ammi* because the petals are destitute of a transverse fold; but W. & A. are correct in saying (*Prodr.* 368) that they are just like those of other *Carums*.

8. **C. khasianum,** *C. B. Clarke*; lower leaves 3-partite pinnate or sub-2-pinnate ultimate segments oblong crenate-serrate, fruit very nearly as in *C. copticum*, but shorter.—Ptychotis ? sp. *Wall. Cat.* 7218. Ptychotis sp. 9, *Herb. Ind. Or. H. f. & T.*

KHASIA MTS.; alt. 3000–5000 ft., common, *Wallich*, &c.

Pubescent throughout, or the lower part glabrescent. *Root* fusiform. *Stem* 2–4 ft.,

erect, corymbose upwards. Ultimate segments of the radical *leaves* often 2 by ½ in., narrowed at the base, distinctly reticulate-nerved, of the upper narrower, sometimes filiform. *Bracts* 0–5, ¼ in., linear; rays 4–8, ½–1½ in., hispid; pedicels 8–16, $\frac{1}{8}$–$\frac{1}{5}$ in., bracteoles shorter than the pedicels. *Fruit* $\frac{1}{16}$ in., ovoid, muricate hispidulous, ridges prominent; carpels subpentagonous, dorsally subcompressed; vittæ solitary, small.

9. **C. anethifolium,** *Benth. in Gen. Pl.* i. 891; leaves 2–3-pinnate ultimate segments linear, bracts 4–5 linear, rays 15–40 very pubescent. Athamanta anethifolia, *Wall. Cat.* 569. Ptychotis anethifolia, *DC. Prodr.* iv. 108. Pimpinella anethifolia, *Don Prodr.* 184.

NIPAL, *Wallich.* KUMAON; Almora alt. 5000 ft., *Strachey & Winterbottom.*

Puberulo-pubescent. *Root* fusiform. *Stem* 2–4 ft., erect, leafy, corymbose upwards with long peduncles. *Leaves* 2–3–4-pinnate, ultimate segments $\frac{1}{8}$–$\frac{1}{3}$ in., sometimes lanceolate-linear; rays ½–1¼ in.; bracteoles 4–8, $\frac{1}{8}$–$\frac{1}{6}$ in., linear; pedicels 15–30, $\frac{1}{8}$–$\frac{1}{5}$ in.—Ripe *fruit* not seen; young very pubescent.

10. **C. Falconeri,** *C. B. Clarke*; leaves 2–3-pinnate ultimate segments linear, bracts 4–5 narrowly oblong-linear subobtuse, rays 3–7 glabrous or nearly so.—Ptychotis sp. 8, *Herb. Ind. Or. H. f. & T.*

GURWHAL; *Falconer*; alt. 7000–9000 ft., *Edgeworth*; Chiringa, alt. 7000 ft., *Strachey & Winterbottom*; Mussooree, *Dr. Bacon.*

Glabrous except the pedicels, flowers, and fruits. *Root* fusiform. *Stem* 2–4 ft., erect, corymbose upwards. Upper *leaves* reduced sometimes to the dilated sheaths; ultimate segments very long in all the leaves, sometimes 2–3 by $\frac{1}{16}$ in.; rays ½–1½ in.; bracteoles 4–6, $\frac{1}{6}$ in., oblong, subobtuse; pedicels 8–16, $\frac{1}{8}$–¼ in., with scattered hairs. *Petals* pubescent. *Fruit* $\frac{1}{12}$ in., ovoid, narrowed upwards, densely hairy.—Appears closely allied to *C. anethifolium*; possibly De Candolle's description of *P. anethifolia* (*Prodr.* iv. 108) was intended to include this.

12. SIUM, *Linn.*

Glabrous *herbs*. *Leaves* pinnate, pinnæ toothed. *Umbels* compound terminal and lateral; bracts and bracteoles several. *Calyx-teeth* acute, or obsolete. *Petals* white, emarginate. *Fruit* ovoid or oblong, laterally compressed, constricted at the commissure (but the constriction masked in the Indian species by the large corky lateral ridges); primary ridges prominent, obtuse, frequently thickened; furrows 3–2- (or 1-) vittate; carpophore (ex DC.) completely bipartite, each half adnate to the adjoining mericarp. *Seed* terete.—DISTRIB. Species 4, in the N. Temperate Zone: 1 in South Africa.

The generic character is here somewhat altered from Bentham's (in Gen. Plant.), in order to retain the Indian species in *Sium* rather than in *Pimpinella*. *Sium* is here separated by the large simple pinnæ of the leaves, and the thickened prominent ridges of the fruit.

1. **S. latijugum,** *C. B. Clarke*; pinnæ of the lower leaves 1 in. ovate or ovate-lanceolate, calyx-teeth 0, fruit elliptic, ridges triangular obtuse corky much wider than the 1-vittate furrows.

KASHMIR and BALTISTHAN, in ditches, alt. 5000–9000 ft.; very common.

Root, stem, leaves, and flowers closely resembling *S. latifolium*, which differs in its smaller pinnæ, acute calyx-teeth, less thick ridges of the fruit, and many vittæ scattered nearly all round the carpels. *S. latijugum* is that plant which Bentham (*in Gen. Pl.* ii. 893) refers to as that variety of *S. lancifolium* in which the ridges are broader nearly completely covering the furrows: but it can hardly belong to the

same genus as the true *S. lancifolium* in which the fruits are much smaller the ridges slender with broad 3-vittate furrows. *S. nipponicum, Maxim. in Bull. Acad. Petersb. Mel. Biol.* ix. 766, is very near *S. latijugum,* but its calyx-teeth are manifest, and there are vittæ scattered under the ridges besides the subsolitary vittæ in the furrows. In *S. multijugum* the lateral ridges are rather larger than the others, and form with the commissure a wide plane face, there are 2 vittæ only on the commissure close to its medial line. The 4 vittæ on the outer faces of the carpels are large, exactly occupying the furrows. The seed is very accurately terete.

13. **PIMPINELLA,** *Linn.*

Herbs, biennial or perennial. *Leaves* 1–2-pinnate or 1–2-ternate or decompound, rarely undivided, toothed. *Umbels* compound; bracts few or 0; bracteoles usually linear, sometimes 0. *Flowers* hermaphrodite or polygamo-monœcious. *Calyx-teeth* 0 or small, lanceolate. *Petals* usually emarginate, ovate acute or lanceolate caudate. *Fruit* laterally compressed, usually constricted at the commissure, ovate or ovate-oblong or narrow-oblong; carpels terete or subpentagonal, often dorsally compressed, plane on the inner face; ridges slender, obscure or prominent; furrows 2–3-vittate (in *P. cæspitosa* 1-vittate); carpophore entire 2-fid or 2-partite. *Seed* terete, $\frac{1}{2}$-terete or dorsally subcompressed, inner face plane or nearly so.—DISTRIB. Species 70, in the northern hemisphere, with a few in S. Africa and S. America.

* *Fruit glabrous or very nearly so.* (See also No. 16, *P. diversifolia, var. alpina*).

1. **P. achilleifolia,** *C. B. Clarke*; glabrous, lower cauline leaves 3–4-pinnate ultimate segments linear-lanceolate, bracts 1–5 $\frac{1}{3}$–$\frac{2}{3}$ in. linear, rays 6–10. Athamanta achilleifolia, *Wall. Cat.* 568. Ptychotis achilleifolia, *DC. Prodr.* iv. 109.

Temperate and subalpine HIMALAYA, *Wallich,* &c.; from KUMAON; Naini Tal, alt. 8500 ft., *Str. and Wint.*; to SIKKIM; Jongri, 13,000 ft., *C. B. Clarke.*

Stem 3–4 ft., erect, corymbose upwards, with long peduncles. Quaternary *pinna* $\frac{1}{4}$–$\frac{1}{8}$ in., often 3-furcate, somewhat rigid, upper leaves reduced, sometimes almost to the inflated sheaths. *Bracteoles* 4–6, $\frac{1}{6}$ in., linear; rays $\frac{1}{2}$–$2\frac{1}{2}$ in.; pedicels 8–20, $\frac{1}{12}$–$\frac{1}{4}$ in. *Fruit* $\frac{1}{10}$ in., elliptic, oblong, glabrous, laterally compressed, ridges distinct, furrows 2–3-vittate; disc conical, prominent.

2. **P. nervosa,** *C. B. Clarke*; cauline leaves twice 3-partite secondary pinnæ 1–2 in. broadly lanceolate serrate nerves beneath much elevated minutely scabrid.

KHASIA MTS.; Nonkreem, alt. 5500 ft., *H. f. & T.*

Nearly glabrous. *Stem* 2–3 ft., stout. *Peduncles* 1–6 in. *Bracts* 0; rays 6–12, 1–$2\frac{1}{2}$ in.; bracteoles 3–8, linear, overtopping the umbellules. *Flowers* all hermaphrodite. *Calyx-limb* 0. *Petals* emarginate, white or purplish. *Styles* short. *Fruit* $\frac{1}{8}$ in., crowned by short conic style-bases, glabrous; carpels subpentagonal, dorsally subcompressed; ridges distinct, furrows 2–1-vittate.—This from its coarse habit and foliage may be an *Ægopodium,* but there are small vittæ in the unripe fruit.

3. **P. Heyneana,** *Wall. Cat.* 566; lower cauline leaves 3-partite or twice or thrice 3-partite, ultimate segments ovate or ovate-lanceolate narrowed at the base, fruit didymous broader than long. *Kurz in Journ. As. Soc.* 1877, pt. ii. 115. Helosciadium ? Heyneanum, *DC. Prodr.* iv. 106; *W. & A. Prodr.* 368; *Dalz. & Gibs. Bomb. Fl.* 106. Sium triternatum, *Moon Cat.* 22. Seseli

zeylanicum, *Herb. Rottler & Klein.* Anethum trifoliatum, *Roxb. Fl. Ind.* ii. 96 ?.

CIRCARS, *Roxburgh*; DECCAN PENINSULA and CEYLON, frequent in the hills. CHITTAGONG; at Burkul, *C. B. Clarke.* PEGU, *Kurz.*

Nearly glabrous, or the leaves pilose. *Stem* 2–4 ft., erect, branched. Ultimate segments of the lower *leaves* often 1–2 by $\frac{1}{4}$–$\frac{1}{2}$ in., serrate, of the upper narrower sometimes linear. *Bracts* 0; rays 6–12, 1–2 in., glabrous or nearly so; bracteoles 1–2, $\frac{1}{8}$ in., often 0; pedicels 6–10, $\frac{1}{10}$–$\frac{1}{5}$ in. *Fruit* $\frac{1}{20}$–$\frac{1}{16}$ in.; carpels ellipsoid, almost globose, ridges slender, rarely white and conspicuous; disc obsolete; carpophore 2-fid, sometimes deeply. *Seed* nearly terete, not concave on the inner face.—Roxburgh's description of *Anethum trifoliatum*, a native of the Circars, will apply to both *P. Heyneana* and *diversifolia.* Wallich identified it with his *trifoliata* (*diversifolia*, DC.) a Himalayan plant, but W. & A. with more probability refer it to *P. Heyneana.*

4. **P. sikkimensis,** *C. B. Clarke*; cauline leaves 2- sub-3-pinnate, ultimate segments oblong bristle-serrate, fruit $\frac{1}{8}$ in. elliptic longer than broad.—Ptychotis sp., *Herb. Ind. Or. H. f.*

SIKKIM; common in damp forests, alt. 4–7500 ft., *J. D. H., C. B. Clarke.*

Glabrous or sparsely setulose. *Stem* 2–4 ft., corymbose. *Leaves* large, ovate; pinnæ and pinnules ($\frac{1}{4}$ in.) opposite. *Bracts* 0 or 1–2, scarcely $\frac{1}{4}$ in., linear; rays 6–14, 1–3 in., stout, angular, divaricate; bracteoles few, scarcely $\frac{1}{8}$ in., linear; pedicels very many, but only 6–12 fruiting, $\frac{1}{2}$–$\frac{3}{4}$ in. *Calyx-teeth* lanceolate. *Petals* emarginate, greenish-white; disc prominent; styles very short. *Fruit* slightly narrowed upwards; ridges not prominent; carpophore stout, undivided; carpels much dorsally compressed, inner face concave; vittæ usually solitary in the two dorsal furrows, and in pairs in the two lateral ones.

5. **P. Wallichii,** *C. B. Clarke*; cauline leaves 2–3-pinnate tertiary pinnæ pinnatifid ultimate segments narrowly lanceolate, fruit ellipsoid broader than long.

NIPAL; *Wallich in Herb. Hook.* SIKKIM; alt. 4000–6000 ft., frequent, *C. B. Clarke.*

Glabrous. *Stem* 2–4 ft., erect, branched. *Leaves* large, ovate, pinnæ and pinnules opposite, all similarly cut, ultimate segments $\frac{1}{10}$–$\frac{1}{4}$ in., often 3-fid, not setulose. *Bracts* 0; rays 6–12, $\frac{3}{4}$ in., rigid; bracteoles 1–2, less than $\frac{1}{4}$ in., linear, or 0; pedicels 8–12, hardly $\frac{1}{8}$ in. *Fruit* $\frac{1}{12}$ in., laterally subcompressed; disc inconspicuous; ridges prominent; carpophore slender, 2-partite; carpels dorsally compressed, subpentagonal, plane on the inner face; vittæ externally somewhat conspicuous, usually 3 in each furrow and 4 on the commissure.

6. **P. Saxifraga,** *Linn.*; *DC. Prodr.* iv. 120; radical leaves pinnate pinnæ round or elliptic toothed upper sub-2-pinnate, fruit ellipsoid rather longer than broad. *Boiss. Fl. Orient.* ii. 873.—Var. *dissectifolia*; pinnæ (even of the radical and lower cauline leaves) deeply lobed, lobes lanceolate.

VAR. *dissectifolia*; KASHMIR; Tilail, alt., 13,000 ft., and WESTERN TIBET; KARAKORUM, alt 14,000 ft.; *C. B. Clarke.*—DISTRIB. Europe, Northern and Western Asia.

Glabrous or very nearly so, branched from the root. Stem 8–16 in., curved, striate, little leafy upwards. *Leaves* oblong, pinnæ $\frac{1}{2}$–$\frac{3}{4}$ in. diam. *Bracts* 0; rays 5–10, $\frac{1}{2}$–$1\frac{1}{2}$ in., unequal, stout, ascending; bracteoles 3–5, $\frac{1}{8}$ in., linear; pedicels 5–10; $\frac{1}{20}$–$\frac{1}{10}$ in. *Petals* often pink or purplish. *Fruit* $\frac{1}{8}$ in.; carpels $\frac{1}{2}$-terete, subpentagonal, dorsally subcompressed; inner face plane; ridges thin, distinct; vittæ 2–3 in each furrow; carpophore stout, often 2-partite. *Seed* concave on the inner face.—This does not exactly agree in the cutting of the leaf with any described form of *P. Saxifraga* and the styles are very short; it may be *P. rhodantha, Boiss. in Tchih. As. Min.* i. 414, *Fl. Orient.* ii. 874.

7. **P. acuminata,** *C. B. Clarke*; lower cauline leaves 2-pinnate secondary pinnæ toothed or incised, pedicels slender, fruit terete. Reutera acuminata, *Edgw. in Trans. Linn. Soc.* xx. 52

From KASHMIR to KUMAON, alt. 4–8000 ft., frequent.

Glabrous, or the leaves obscurely pubescent. *Stem* 3–4 ft., corymbose upwards. Secondary *pinnæ* 1–2 in. *Bracts* 1–5, $\frac{1}{8}$–$\frac{1}{3}$ in., linear; rays 5–10, 1–3 in.; bracteoles 3–5, $\frac{1}{6}$ in., linear; pedicels $\frac{1}{3}$–$\frac{1}{2}$ in. *Petals* yellowish-green or nearly white. *Fruit* nearly globose, laterally compressed, yellowish-brown, subviscid; carpels terete, ridges slender, furrows 2–3-vittate; disc small.—Easily recognised by the long slender pedicels.

8. **P. bella,** *C. B. Clarke*; leaves all similarly cut 2-pinnate secondary pinnæ pinnatifid ultimate segments oblong entire mucronate, fruit narrowly oblong.

SIKKIM; alt. 10,000–12,000 ft., *Thomson, C. B. Clarke, N. Gamble*; on the watershed between Sikkim and Nipal.

Glabrous. *Rootstock* long, fusiform. *Stem* 1–3 ft., corymbose upwards. *Leaves* large, ovate, pinnæ and pinnules opposite, often white beneath. *Bracts* 0, or 1 linear, 1 in.; rays 10–15, 1–2 in., angular, stout; bracteoles 2–5, $\frac{1}{4}$ in., linear; pedicels 8–16, $\frac{1}{4}$–$\frac{1}{3}$ in. *Calyx-margin* obsolete. *Petals* ovate-lanceolate, plane. *Disc* large, conical. *Carpophore* 2-partite. *Fruit* $\frac{1}{8}$ in.; carpels terete, subpentagonal, inner face hardly grooved; ridges slender, furrows 2–3-vittate.

9. **P. Hookeri,** *C. B. Clarke*; leaves pinnate sub-2-pinnate segments of the lower leaves oblong of the upper linear, fruit ovate as long as broad.—Acronema sp. 2, *Herb. Ind. Or. H. f. & T.*

SIKKIM, Northern valleys, Samdong and Lachen, alt. 8–11,000 ft., *J. D. H.*

Glabrous. *Root* tuberous. *Stem* 1–2 ft., slender, sparingly leafy, remotely corymbose or subvirgate. Lower *leaves* cut and whitened beneath as in *P. bella*, segments 1–2 in.; upper much reduced with very narrow segments. *Umbels* subracemose upwards, rays few and slender; bracts and bracteoles 0, or inconspicuous; pedicels 4–6, $\frac{1}{3}$–$\frac{2}{3}$ in., slender. *Petals* very small, often elongate with a whip-like tail much exceeding their own length (but this does not appear uniformly present, some petals on the same plants being emarginate with a short inflexed point). *Fruit* $\frac{1}{18}$–$\frac{1}{12}$ in. globose, narrowed at the apex, laterally subcompressed, yellow-brown; ridges obscure; furrows 2–3-vittate; disc evanescent; carpophore slender, 2-partite.

10. **P. tenera,** *Benth. in Gen. Pl.* i. 894; lower cauline leaves pinnate pinnæ ovate ultimate segments of the upper small, fruit ovate-oblong conspicuously narrowed upwards. Sison ? tener, *Wall. Cat.* 593. Helosciadium ? tenerum, *DC. Prodr.* iv. 105. Acronema tenerum, *Edgw. in Trans. Linn. Soc.* xx. 51.

HIMALAYA, alt. 8–15,000 ft.; from GURWHAL to SIKKIM; *Wallich, Falconer, J. D. H., C. B. Clarke.*

Root tuberous (not annual as Benth. l. c.). *Stem* 6–8, rarely 12 in. *Petals* often excessively elongate as in *P. Hookeri*. *Furrows* 2–3-vittate.—Closely resembling *P. Hookeri* but smaller, the ultimate segments of the upper leaves not exceeding $\frac{1}{4}$ in., the carpophore undivided thick; fruit $\frac{1}{12}$ in., elongated, narrower upwards.

VAR. *dissecta*; leaves 2–3-pinnate ultimate segments scarcely $\frac{1}{8}$ in. ovate acutely 3-lobed or longer linear subobtuse.—With the type.

11. **P. acronemæfolia,** *C. B. Clarke*; leaves 2–3-pinnate ultimate segments ovate acutely 3-lobed or longer linear subobtuse, peduncles 1–2 on each stem 2–6 in. stout, bracts 1–5 $\frac{1}{5}$ in. linear.

SIKKIM, alt. 11,000 ft., Chola, Lachoong, *J. D. H.*; Singaleleh, alt. 10,000 ft., *C. B. Clarke.*

Glabrous, 3–8 in.; root tuberous. *Leaves* exceedingly like those of *P. tenera var. dissecta*; segments $\frac{1}{8}$ in. *Rays* 6–12, 1–1$\frac{1}{2}$ in., stout; bracteoles small; pedicels 10–16, $\frac{1}{6}$–$\frac{1}{3}$ in. *Petals* elliptic, obtuse, plane, white or pinkish. *Fruit* nearly as that of *P. tenera*.—This closely resembles *Vicatia millefolia*, but the plane petals exclude it from that genus.

12. **P. hastata,** *C. B. Clarke*; lower cauline leaves cordate or hastate triangular-lanceolate crenate serrate villous beneath, fruit ovate as broad as long.—Pimpinella, sp. 17, *Herb. Ind. Or. H. f. & T.* Umbellifera, No. 875, *Griff. Itin. Notes* 56.

KHASIA MTS.; Moflong, alt. 6000 ft., *Griffith, H. f. & T.*; Mairung, alt. 5000 ft., *C. B. Clarke.*

Root fusiform. *Stem* 3 ft., erect, obscurely pubescent, sparingly leafy, laxly corymbose upwards. *Leaves* 2–4 by 1–1$\frac{1}{2}$ in., nearly glabrous above; upper cauline sometimes 3-partite with cordate ovate leaflets, uppermost sometimes reduced with narrow segments. *Bracts* 0; rays 5–8, 1–1$\frac{1}{2}$ in., scabrid, subpubescent; bracteoles 0, or 1–2, $\frac{1}{8}$ in., linear; pedicels 5–10, $\frac{1}{10}$–$\frac{1}{8}$ in. *Fruit* $\frac{1}{12}$–$\frac{1}{10}$ in., brown, subdidymous, acute upwards, dorsally subcompressed, inner face slightly concave; ridges obscure, furrows 2-vittate; disc prominent, conical; carpophore 2-fid or 2-partite. *Seed* $\frac{1}{2}$-terete, dorsally compressed, inner face slightly concave.

13. **P. Leschenaultii,** *DC. Prodr.* iv. 122; lower cauline leaves cordate orbicular serrate slightly pubescent beneath, fruit ovate-oblong glabrous or when young with a few scattered hairs. *W. & A. Prodr.* 369; *Wight Ic.* t. 1005; *Thwaites Enum.* 131.

NILGHIRIS, alt. 6–8000 ft.; *Wight*, &c. CEYLON, alt. 6000 ft., *Thwaites.*

Root fusiform, perennial. *Stem* 1–2 ft., virgate, obscurely pubescent. *Leaves* 1–2 in. diam., glabrous above or nearly so; upper reduced to sheaths, or 0. *Bracts* 0, or 1 small linear; rays 6–16, 1–1$\frac{1}{2}$ in., scabrid-pubescent; bracteoles 1–3, $\frac{1}{8}$ in., linear; pedicels 6–12, $\frac{1}{8}$–$\frac{1}{5}$ in. *Fruit* $\frac{1}{10}$–$\frac{1}{8}$ in., narrowed upwards, strongly compressed, brown, finally glabrous; carpels $\frac{1}{2}$-terete, not dorsally compressed, inner faces plane; ridges not prominent, furrows 3-vittate; disc prominent, conical.—Thwaites says his Ceylon examples are intermediate between *P. Leschenaultii* and *P. Candolleana*; but they are typical *P. Leschenaultii* with large laterally compressed fruits, &c.

** *Fruit papillose-scabrous or pubescent.* (See also No. 13, *P. Leschenaultii*).

14. **P. Candolleana,** *W. & A. Prodr.* 369; lower cauline leaves ovate-cordate serrate pubescent beneath, fruit ovate scabrid with clustered hairs when ripe. *Wight Ic.* t. 341.

MTS. of the SOUTH DECCAN, alt. 5–8000 ft., frequent.

Resembles generally *P. Leschenaultii* but is more pubescent. Lower *leaves* usually subacute, often pubescent above, sometimes 3-partite with petioluled leaflets; upper often 1–2-pinnatifid, ultimate segments oblong acute. *Fruit* very scabrid, shortly acute at the apex, very slightly compressed laterally, always much smaller and shorter than that of *P. Leschenaultii*; carpels $\frac{1}{2}$-terete, dorsally subcompressed, inner face plane; ridges prominent, furrows 2–3-vittate; carpophore stout, entire.—*P. javana* DC. Prodr. iv. 122 is nearly allied to this but has the upper leaves reduced and not pinnatifid, and the fruits less strongly ribbed.

15. **P. monoica,** *Dalz. in Hook. Kew Journ.* iii. 212; lower cauline leaves 3-partite leaflets long-petioluled cordate-ovate, fruit terete papillose subscabrid.

Dalz. & Gibs. Bomb. Fl. 106. Helosciadium Wallichianum, *Miq. in Pl. Hohenack.* No. 633.—Pimpinella sp. 10, *Herb. Ind. Or. H. f. & T.*

MTS. of MALABAR and the SOUTH DECCAN; *Wight*, &c.

Minutely pubescent or nearly glabrous. *Stem* 7–8 ft. (Dalzell), much divided upwards. *Leaflets* 2–3 by 1–2 in., sharply serrate; petiolules $\frac{1}{2}$–2 in.; upper leaves often much reduced, cut into setaceous linear segments. *Bracts* 0, rarely 1 linear; rays 6–12, $\frac{1}{2}$–$1\frac{1}{2}$ in.; bracteoles 1–3, $\frac{1}{6}$ in., linear, or more often 0; pedicels 8–20, outer $\frac{1}{4}$ in. male, inner $\frac{1}{8}$ in. hermaphrodite. *Fruit* $\frac{1}{16}$ in., subdidymous, scarcely acute; carpels $\frac{1}{2}$ terete, inner face plane; ridges obscure, furrows 2-vittate; disc not prominent; carpophore entire, or very shortly 2-fid.

16. **P. diversifolia,** *DC. Prodr.* iv. 122; cauline leaves entire 3-partite or sub-2-pinnate leaflets ovate or cordate-lanceolate pubescent, fruit ovate narrowed upwards hispidulous papillose-rugose or finally nearly glabrous. P. pubescens, *Wall. Cat.* 567. P. trifoliata, *Wall. Cat.* 565. P. sinica, *Hance in Seem. Journ. Bot.* 1868, 113. Helosciadium ? trifoliatum and pubescens, *DC. Prodr.* iv. 106.

Throughout the HIMALAYA, alt. 4–10,000 ft., very common. KHASIA MTS. alt. 3–6000 ft., common.—DISTRIB. China.

Villous, subtomentose, or scarcely pubescent. *Stem* 2–5 ft., corymbose upwards. Radical and lower cauline *leaves* often round-ovate; cauline often with 3–5-leaflets, or twice 3-partite or sub-2-pinnate; segments of the uppermost narrower, occasionally almost linear; leaflets usually 1–3 by $\frac{1}{2}$–1 in., serrate, sometimes laciniate or subpinnatifid. *Bracts* 0, or 1–2, $\frac{1}{4}$–$\frac{1}{2}$ in., linear; rays 6–16, $\frac{1}{2}$–$1\frac{1}{2}$ in., sometimes villous, never quite glabrous; bracteoles 8–3, $\frac{1}{6}$ in., or 0; pedicels 8–16, $\frac{1}{6}$–$\frac{1}{3}$ in., all fruiting. *Petals* emarginate, white greenish or lurid. *Fruit* $\frac{1}{12}$–$\frac{1}{10}$ in., laterally compressed, ridges never prominent sometimes quite obscure, furrows 2–3-vittate; disc not prominent; carpels $\frac{1}{2}$-terete, scarcely subpentagonal, dorsally subcompressed, inner face plane.—A common and variable plant; the north-west examples frequently have the peduncles rays and fruits very villous and the leaves glabrous above. The Khasian have deeply cordate leaflets and papillose-rugose fruit: from these *P. monoica Dalz.* differs only by the minute fruits and the barren outer pedicels.

VAR. 1. *alpina*; petals ovate acute plane, young ovary glabrous, fruit shining yellow-brown glabrous much attenuated upwards. P. trifoliata, *Wall. Cat.* 565 (*type specimen*).—Sikkim, alt. 9–10,000 ft.—Rays of the umbel pubescent.

VAR. 2. *divisa*; lower cauline leaves pinnate and 2-pinnatifid, young fruit terete clavate upwards, disc yellow-brown. Pimpinella sp. 5 *Herb. Ind. Or. H. f. & T.*—Kashmir and Kistwar, alt. 7000–8000 ft., *Thomson*.—Probably a new species but there is no ripe fruit.

17. **P. Stracheyi,** *C. B. Clarke*; leaves simple and 3-partite leaflets ovate pubescent, fruit oblong narrowed at both ends, style-bases cylindric apex conical.—Pimpinella sp. 3, *Herb. Ind. Or. H. f. & T.*

KUMAON; Dhauli River, Samangentha, alt. 7500 ft., *Strachey & Winterbottom.*

Generally resembling *P. diversifolia* on a small scale; stems 6–16 in., grey-villous, as the Kumaon examples of *P. diversifolia* generally are. *Fruit* $\frac{1}{8}$ in.; carpels terete, ridges slender, furrows 2-vittate. Young *ovary* villous. *Fruit* ultimately glabrescent shining yellow-brown.—Nearly allied to No. 22, *P. cæspitosa.*

18. ? **P. Parishiana,** *Kurz in Journ. As. Soc.* 1872, pt. ii. 309, and 1877, pt. ii. 115; leaves pinnate or 2–3-partite leaflets ovate acute serrate or laciniate, bracts 2–5 almost sheathing the rays, ovary minutely pubescent.

MOULMEIN, and MARTABAN, *Kurz*; on the Zwabakin; *Parish.*

Habit of *P. diversifolia*, much divided and very leafy upwards. *Leaflets* 1–2 by

$\frac{1}{2}$–1 in., sparingly pubescent, very irregularly cut, sometimes pinnatifid. *Umbels* pubescent, nearly as in *P. diversifolia*, but with bracts and prominent bracteoles. *Bracts* $\frac{1}{8}$–$\frac{1}{4}$ in., pubescent, lanceolate or the bases broad and subconnate; bracteoles very similar, exceeding the flowering umbellules. *Fruit* not seen.—This resembles *P. diversifolia*, differing in the more developed involucres: in the absence of ripe fruit, it may be a *Heracleum* or some other genus.

19. **P. tomentosa,** *Dalz. ms.*; lower cauline leaves 2–3-pinnate ultimate leaflets ovate acutely laciniate, fruit narrowly oblong attenuate upwards scabrid with many ascending ovate small scales.—Pimpinella sp. 8, *Herb. Ind. Or. H. f. & T.* ? Heracleum tomentosum, *Dalz. & Gibs. Bomb. Fl.* 108, 313 (*not of Smith*).

BOMBAY (probably in the Ghats) *Dalzell*; Concan, *Stocks*.

Pubescent, somewhat villous upwards, hardly tomentose. *Stem* 2–4 ft., much branched upwards. Lower *leaves* large, ovate, ultimate leaflets 1 in., petioluled, serrated with very long teeth; upper often reduced to sheaths. *Bracts* 0; rays 4–8, 1 in.; bracteoles 0, or 1–2 very small linear; pedicels 3–10, $\frac{1}{12}$–$\frac{1}{6}$ in. *Fruit* $\frac{1}{8}$ in., almost rostrate, laterally compressed, hardly constricted at the commissure; style-bases elongate, conical, yellow-brown; carpels terete, obscurely pentagonal; ridges very obscure, furrows 2–3-vittate; carpophore slender, 2-fid.

20. **P. adscendens,** *Dalz. in Hook. Kew Journ.* ii. 261; lower cauline leaves oblong pinnate pinnæ ovate or round rarely 3-partite, fruit ovate minutely pilose. *Dalz. & Gibs. Bomb. Fl.* 106.

BOMBAY, *Dalzell*; Nasik, *Edgeworth*; BELGAUM, *Dr. Ritchie*; CONCAN, *Stocks*.

Minutely pubescent or glabrous. *Stems* many, 8–24 in. Lower *leaves* with 4–8 pair of pinnæ, terminal leaflet often large, pinnæ $\frac{1}{4}$–$\frac{3}{4}$ in. diam., acutely serrate; upper leaves reduced, often more divided. *Bracts* 4–7, $\frac{1}{6}$–$\frac{1}{3}$ in., linear; rays 4–12, 1 in., glabrous; bracteoles 4–7, $\frac{1}{6}$ in., linear, minutely ciliate-pubescent; pedicels 8–16, $\frac{1}{8}$–$\frac{1}{5}$ in. *Fruit* $\frac{1}{16}$ in., brown, hardly acute, laterally compressed, disc not prominent; carpels terete, hardly pentagonal, not dorsally compressed; ridges obscure; furrows 2–3-vittate.

21. **P. lateriflora,** *Dalz. & Gibs. Bomb. Fl.* 106; "leaves ternate leaflets twice ternate lobes of the lower leaves lanceolate of the upper linear all acute mucronate, fruit densely covered with small granular tubercles." *Dalz. l. c.*

DECCAN; in ravines, common; *Dalzell*.

Puberulous, 1–1$\frac{1}{2}$ ft., erect. *Peduncles* long, slender, leaf-opposed; umbels 3–10; bracts 3–7, subulate; bracteoles 7, subulate, as long as the pedicels. *Flowers* pink.—Not seen; the above copied from Dalzell.

22. **P. cæspitosa,** *Benth. in Gen. Pl.* i. 895; pubescent, lower leaves oblong pinnate pinnæ ovate, bracts 4–5 linear-lanceolate villous, fruit oblong, furrows 1-vittate. Petrosciadium cæspitosum, *Edgw. in Trans. Linn. Soc.* xx. 51. ? Thaspium foliosum, *Royle Ill.* 40.

GURWHAL; Niti, alt. 12,000 ft., *Edgeworth, Strachey & Winterbottom*. KUNAWUR; above Rogi, alt. 9–10,000 ft., *Thomson*.

Rootstock short, woody, branched. *Stems* many, 4–8 in., sparingly leafy upwards. *Pinnæ* of the lower leaves $\frac{1}{4}$–$\frac{3}{4}$ in. diam., coarsely serrate, hardly mucronate, sometimes lobed or 3-fid. *Bracts* $\frac{1}{4}$–$\frac{1}{3}$ in.; rays 4–6, $\frac{3}{4}$ in., with much spreading soft white hair; bracteoles 4–6, $\frac{1}{6}$ in., lanceolate; pedicels 6–12, $\frac{1}{5}$ in. *Fruit* $\frac{1}{12}$–$\frac{1}{10}$ in., very villous when young, ultimately glabrescent, laterally compressed; style-bases

large, subglobose on the young fruit; carpels $\frac{1}{2}$-terete, dorsally compressed; ridges obscure; furrows 1-vittate on the few fruits available.—Strach. & Wint. suggest that this is the *Thaspium foliosum*, Royle.

14. **OSMORRHIZA,** *DC.*

Perennial *herbs*. *Leaves* twice 3-partite or sub-2-pinnate, ultimate segments large. *Umbels* compound, very lax; bracts few narrow, or 0; bracteoles much shorter than the pedicels. *Calyx-teeth* obsolete. *Petals* emarginate, white. *Fruit* linear-oblong, long-attenuate at base; laterally compressed, somewhat constricted at the commissure; carpels terete, subpentagonal, grooved on the inner face; primary ridges slender, distinct, secondary 0; furrows 2–3-vittate; carpophore slender, 2-fid. *Seed* $\frac{1}{2}$-terete, dorsally subcompressed, inner face grooved.—DISTRIB. Species 4, North Asia, Japan, North America, Andes.

1. **O. Claytoni,** *C. B. Clarke*; leaves pubescent, bracts 1–5, fruit hispid below with erect adpressed bristles. O. brevistylis, *DC. Prodr.* iv. 232; *Royle Ill.* p. 233. O. longistylis, *DC. l. c.* 232. O. laxa, *Royle Ill.* 233 t. 52.

NORTH-WEST HIMALAYA, from KASHMIR to KUMAON, alt. 5000–8000 ft., frequent. —DISTRIB. N.E. Asia, Japan, temperate N. America.

Rootstock not tuberous. *Stem* 2–5 ft. *Leaves* large, ovate; ultimate segments 1–2 in. coarsely toothed, sometimes larger and pinnatifid. *Bracts* $\frac{1}{3}$ in., linear; rays 3–6, 1–4 in.; bracteoles 4–6, $\frac{1}{4}$ in., lanceolate; fruiting pedicels 3–6, $\frac{1}{2}$–$1\frac{1}{2}$ in.; several other short abortive pedicels indicate male flowers. *Fruit* $\frac{3}{4}$ by $\frac{1}{12}$–$\frac{1}{10}$ in., rather suddenly narrowed into conical style-bases; styles in fruit variable in length. —The Japanese examples have the pinnæ more pinnate, the Himalayan have the pinnæ generally 3-partite: the length of styles cannot be invariably connected with any other character, geographical or morphological.

15. **CHÆROPHYLLUM,** *Linn.*

Herbs, glabrous or hairy. *Leaves* pinnately decompound, or 2-pinnate with pinnatifid pinnules. *Umbels* compound; bracts 1–2, linear, or 0; bracteoles 3–6, lanceolate, or linear, or 0. *Flowers* white, usually polygamous; the central subsessile fertile, others pedicelled male or hermaphrodite. *Calyx-teeth* obsolete (Indian species). *Petals* emarginate. *Fruit* oblong, narrowed upwards, glabrous (in the Indian species), laterally compressed, narrowed at the commissure; primary ridges broad, obtuse, prominent (in *C. cachemiricum* obscure); furrows 1-vittate (or vittæ 0 in *C. capnoides*); carpels terete, inner face with a deep T-shaped groove; carpophore stout, undivided or shortly 2-fid; disc not prominent on the fruit. *Seed* terete, inner face with a deep narrow groove, widened into a hollow in the centre of the seed.—DISTRIB. Species 30; in temperate regions.

Technically separated from *Anthriscus* by the more prominent ridges of the fruit. As regards the Indian species, the only one referred to *Anthriscus* is easily distinguished by the very scabrid fruit.

1. **C. villosum,** *Wall. Cat.* 558 *chiefly*; stem with many long deflexed white hairs especially below, upper leaves 2–3-pinnate more finely divided than

the lower ultimate segments small, fruit oblong scarcely beaked. *DC. Prodr.* iv. 225.

HIMALAYA, from KASHMIR to SIKKIM; alt. 5000–12,000 ft., frequent. KHASIA MTS., alt. 4000–6000 ft., frequent.

Root fusiform. *Stem* 1–4 feet, erect, branched, always hispid below, often hairy upward. *Leaves* large, secondary pinnæ of the upper pinnate or pinnatifid, ultimate segments scarce $\frac{1}{4}$ in., with 2–4 lanceolate teeth, often with scattered hairs; segments of the lowest often 1–3 by 1 in. pinnatifid scarcely half-way down; upper sheaths usually inflated, hairy, with prominent white margins. *Bracts* 0; rays 3–6, 1–3 in., stout; bracteoles 2–5, $\frac{1}{4}$–$\frac{1}{3}$ in., linear, often white margined, soon reflexed; pedicels 10–15, often 3–8 fruiting. *Fruit* $\frac{1}{3}$ in., equally broad its whole length, narrowed somewhat suddenly at the tip.

2. **C. reflexum,** *Lindl. in Royle Ill.* 232: glabrous or very sparsely pilose, upper leaves 2-pinnate more finely divided than the lower ultimate segments small, fruit oblong narrowed into a thick cylindric beak. C. villosum, *Wall. Cat.* 558 *in part.*

North-west HIMALAYA; from DALHOUSIE to KUMAON; alt. 5000–9000 ft., frequent.

Much less hairy than *C. villosum*, the fruit larger, and usually 1 (sometimes 2–3), ripen in each umbellule; pedicels of the other flowers being reflexed, as sometimes in a much less degree in *C. villosum.* *Fruit* $\frac{1}{2}$–$\frac{1}{3}$ in., beak $\frac{1}{6}$ in.; vittæ of the commissure 2, in the narrow part of the groove.

3. **C. acuminatum,** *Lindl. in Royle Ill.* 232; more or less hairy, upper leaves 1–2-pinnate pinnæ large oblong closely regularly falcate-serrate, fruit oblong narrowed close under the style-bases.

HIMALAYA from KASHMIR to KUMAON; alt. 5000–9000 ft., frequent.

Stem 2–4 ft., usually with some long white hairs. Lower *leaves* often with ultimate pinnæ 2 by $\frac{1}{2}$ in., oblong, acute, upper reduced with narrower segments. *Umbels* bracts bracteoles and fruit much resembling those of *C. villosum*; petals somewhat larger, often somewhat radiant; fruits smaller ($\frac{1}{3}$ in.) fewer (often 2–3) to the umbellule.—Closely allied to *C. villosum*, though very different in the cutting of the leaves. Lindley puts it next *C. aromaticum*, Jacq., but it more resembles *C. aureum*, Linn.

4. **C. capnoides,** *Benth. in Gen. Pl.* i. 898; root tuberous, leaves 1–2-pinnate ultimate segments oblong entire, fruit oblong-lanceolate vittæ 0. Butinia capnoides, *Dcne. in Jacquem. Voy. Bot.* 70, t. 80.

KASHMIR; *Jacquemont.* KISHTWAR and BANAHAL; alt. 6000–8000 ft., *Thomson.*

Nearly glabrous. *Stem* 12–24 in. *Leaves* 4–8 in., lax, ovate; ultimate segments $\frac{1}{4}$–$\frac{3}{4}$ by $\frac{1}{8}$–$\frac{1}{3}$ in., undulate, mucronate. *Bracts* 0; rays 4–8, 1–3$\frac{1}{2}$ in., stout; bracteoles 4–7, $\frac{1}{6}$ in., lanceolate; pedicels 6–12, $\frac{1}{2}$–1 in., most of them fruiting. *Fruit* $\frac{1}{4}$ in., black, minutely punctate, very much constricted at the commissure. narrowed upwards, scarcely beaked; style-bases narrow, conical; carpels subtrapezoid from the extreme narrowing of the inner face; furrows subconcave, epicarp thin, no trace of vittæ.—The Algerian *Balansæa Fontanesii*, Boiss. & Reut., said hardly to differ from this by Benth., *l. c.*, apart from the crenate lobed leaflets, the large style-bases, and other prominent specific marks, has the fruits broadly grooved on the very wide commissure, and has large vittæ.

5. **C. cachemiricum,** *C. B. Clarke*; upper leaves sub-2-pinnate secondary pinnæ oblong deeply toothed or subpinnatifid, fruit oblong-lanceolate, ridges obscure.

NORTH-WEST HIMALAYAS; Dalhousie, alt. 7000 ft.; *C. B. Clarke.*

Stem 2–3 ft., hispid with reflexed hairs. *Bracts* 0; rays 5–8, ½–1 in.; bracteoles 1–4, ⅛ in., linear, obscure; pedicels 12, the central alone fruiting. *Fruit* ⅛ in.; carpels terete; ridges so obscure that the species should perhaps be referred to *Anthriscus*; furrows 1-vittate, no vittæ in the groove.

VAR. *dissecta*; glabrous, leaves 3-pinnate finely cut, fruit nearly ¼ in. sometimes 2 to the umbellule.—Kashmir, Sind Valley, alt. 12,000 ft., *C. B. Clarke.*—Rays longer and stouter than in the type. Perhaps a distinct species, but the fruit closely agrees with that of *C. cachemiricum* except that it is a little larger.

16. SCANDIX, *Linn.*

Annual *herbs. Leaves* pinnately decompound, ultimate segments small, narrow. *Umbels* compound or simple; bracts 1 or 0, bracteoles several. *Flowers* white, polygamous, often radiant. *Calyx-teeth* 0, or minute. *Petals* emarginate. *Fruit* oblong, laterally compressed, beak many times longer than the seed; carpels terete or dorsally subcompressed, with a T-shaped groove on the inner face; primary ridges distinct, broad or narrow, secondary 0; vittæ solitary in each furrow, slender, or 0; carpophore undivided or 2-fid. *Seed* terete, dorsally subcompressed.—DISTRIB. Species 10; all northern, mostly Mediterranean.

1. **S. Pecten-veneris,** *Linn.*; *DC. Prodr.* iv. 221; bracteoles lanceolate often incised or lobed at the apex, beak of the fruit dorsally compressed hispidulous on the margins, fruit 1–2 in. *Boiss. Fl. Orient.* ii. 914.

KASHMIR; alt. 5000–6000 ft., *Falconer, Thomson.* PUNJAB; Salt Hills, *Cleghorn, Aitchison, Jameson.*—DISTRIB. Cabul to Western Europe.

Stem 6–12 in., glabrous or pilose as are the leaves. *Umbels* simple or compound, short-peduncled; *bracteoles* ¼ in., lanceolate, pubescent or ciliate; pedicels 3–8, hardly $\frac{1}{10}$ in. in fruit. Beak of *fruit* twice as long as the seed; ridges broad, obtuse.

17. ANTHRISCUS, *Hoffm.*

Herbs. *Leaves* 2–3-pinnate, ultimate segments pinnatifid or toothed, often broad. *Umbels* compound; bracts 1–2 or 0; bracteoles several, undivided. *Flowers* white, often polygamous. *Calyx-teeth* 0, or minute. *Petals* emarginate. *Fruit* oblong or ovate-oblong, narrowed shortly at the apex, laterally compressed, constricted at the commissure; often scabrous; carpels terete or dorsally subcompressed, with a T-shaped groove on the inner face; primary ridges not prominent, vittæ solitary in each furrow, minute, or 0; carpophore undivided or 2-fid. *Seed* terete, dorsally subcompressed.—DISTRIB. Species 10, the north temperate regions of the Old World, 1 extending to North-west America.

1. **A. nemorosa,** *Spreng. Pl. Umb. Prodr.* 27; rays 10–15 stout glabrous, bracteoles 5–7 lanceolate pubescent, fruit ovate-oblong clothed with ascending hispid hairs. *DC. Prodr.* iv. 223; *Boiss. Fl. Orient.* ii. 911.

KASHMIR, alt. 7000–11,000 ft.; plentiful.—DISTRIB. N. Asia to E. Europe.

Stem 5–8 ft., sparingly hairy. *Leaves* large with large pinnæ and segments, glabrous, or pubescent beneath. *Bracteoles* ¼ in. *Flowers* often radiant. *Fruits* ¼ in., numerous in each umbellule, black, minutely puncticulate as well as prominently hispid, ridges acute at the apex.

18. **SESELI,** *Linn.*

Herbs, glabrous or pubescent. *Leaves* 2–3-pinnate or twice 3-partite. *Umbels* compound; bracts 0 few or many, undivided or pinnate; bracteoles several or many. *Calyx-teeth* minute, lanceolate or linear, or 0. *Petals* emarginate, white. *Fruit* oblong ovate or circular, not laterally compressed, broadest at the commissure; carpels ½-terete or (in *S. trilobum*) much dorsally compressed; inner face plane or (in *S. trilobum*) concave; ridges strong, obtuse or subacute, lateral hardly larger than the dorsal; vittæ in each furrow solitary, usually prominent; carpophore 2-partite, 2-fid or entire; disc not prominent on the fruit. *Seed* ½-terete; in *S. trilobum* dorsally compressed, inner face excavated.—DISTRIB. Species 40; in the N. temperate zone of the Old World; with 2 doubtful Australian.

1. **S. sibiricum,** *Benth. in Gen. Pl.* i. 901; lower leaves 2-pinnate secondary pinnæ large ovate toothed and pinnatifid sessile or decurrent, calyx-teeth triangular minute deciduous, fruit cylindric villous. *Boiss. Fl. Orient.* ii. 967.

WEST TIBET; *Falconer.* KASHMIR; *Jacquemont.* Kishtwar, alt. 7000–8000 ft., *Thomson.*—DISTRIB. Asia, Russia.

Minutely pubescent or nearly glabrous, 2–4 ft. Lower *leaves* often 1 ft., upper often pinnate; pinnæ somewhat firm in texture, subspinulose, secondary 1–2 in. *Bracts* usually 0 or 1; in the Siberian examples sometimes many; rays 15–40, 1–2½ in., pubescent; bracteoles 5–10, ⅕ in. lanceolate; pedicels 10–25, ⅛–¼ in. Young *fruit* ⅕ in., densely villous, in age less so; carpels ½-terete, dorsally compressed, inner face plane; epicarp somewhat thickened, ridges strong, subequal, vittæ large; carpophore slender, 2-partite. *Seed* plane on the inner face.

2. **S. indicum,** *W. & A. Prodr.* 371; lower leaves 2-pinnate secondary pinnæ ovate lobed pubescent, calyx-teeth 0, fruit subglobose ridges thick. Cnidium diffusum, *DC. Prodr.* iv. 153; *Wight Ic.* t. 569. Athamantha diffusa, *Wall. Cat.* 570. Ligusticum indicum, *Wall. Cat.* 7215. L. diffusum, *Roxb. Hort. Beng.* 21, *Fl. Ind.* ii. 92.

Plains of INDIA; from the foot of the SIWALIKS to ASSAM and COROMANDEL; frequent in CENTRAL BENGAL.

Annual, erect or diffuse, 4–12 in., often much branched. *Leaves* all similarly cut, upper without linear segments. *Bracts* 4–5, ⅓ in., narrowly lanceolate, caudate, pubescent; rays 8–16, ¼–1 in.; bracteoles like the bracts but rather smaller; pedicels 8–16, ⅛ in. *Flowers* white or pinkish. *Fruit* $\frac{1}{12}$–$\frac{1}{10}$ in. (in Roxburgh's drawing copied in *Wight Ic.* t. 569) glabrous; in *Wall. Cat.* 7215, and *W. & A. Prodr.* 371, very hirsute (and hardly half as large); hairs often clubbed or substellate at the apex; carpels ½-terete; vittæ distinct; carpophore entire.—There are examples with fruit intermediate between the two extreme types above described.

3. **S. daucifolium,** *C. B. Clarke*; leaves 2–3-pinnate ultimate segments linear or narrowly lanceolate, bracts many often divided, fruit globose glabrous. Ammi daucifolium, *Wall. Cat.* 7209.—Discopleura sp., *Benth. in Gen. Pl.* i. 907.

East BENGAL; from BHOTAN and ASSAM to DACCA and CHITTAGONG; *Wallich,* &c. —DISTRIB. China.

Annual, erect, 8–16 in., glabrous or nearly so, very leafy upwards. Margin of the *leaves* minutely serrulate. *Peduncles* often leaf-opposed, short, stout; bracts ½–¾ in., sometimes pinnate; rays 8–16, usually shorter than the bracts; bracteoles 6–12, ¼ in., linear; pedicels 10–25, ⅛–⅙ in. *Calyx-teeth* 0. *Petals* white or pinkish.

Fruit much like *S. indicum* but smaller and quite glabrous; ridges subequal.—Mr. Bentham did not possess well-ripened fruit when he referred this species to *Discopleura.* Hance referred the Chinese examples doubtfully to *Cnidium Monnieri, Cuss.*; *DC. Prodr.* iv. 152; to which *Seseli daucifolium* bears a general resemblance; but it is more leafy upwards with short peduncles, and the fruit is much smaller and not dorsally compressed.

4. **S. trilobum,** *Benth. in Gen. Pl.* i. 901; lower leaves 2-pinnate or twice 3-partite, secondary pinnæ ovate lobed petioluled villous or tomentose beneath, calyx-teeth subulate minute deciduous, fruit ovate acute villous. Scaphespermum trilobum, *Edgw. in Trans. Linn. Soc.* xx. 58.

North-West Himalaya; NITI, alt. 8000–10,000 ft., *Edgeworth.* GURWHAL, *Falconer.* KUMAON; Millem, alt. 11,000 ft., *Strachey & Winterbottom.*

Stem 8–24 in., villous and little leafy upwards. *Leaves* minutely pubescent above; secondary pinnæ $\frac{1}{4}$–$\frac{3}{4}$ in., crenate-serrate or irregularly lobed. *Bracts* 3–5, $\frac{1}{8}$ in.; rays 5–10, 1–2 in.; bracteoles 5–8, $\frac{1}{6}$–$\frac{1}{4}$ in., linear; pedicels 10–20, $\frac{1}{6}$–$\frac{1}{4}$ in. *Fruit* $\frac{1}{8}$–$\frac{1}{6}$ in., but little longer than broad; carpels convexo-concave, much dorsally compressed; ridges strongly marked, subequal, vittæ prominent; carpophore deeply 2-fid. *Seed* excavated on the inner face, differing thus from all other species of *Seseli.*—Perhaps a *Pycnocycla.*

19. PYCNOCYCLA, *Lindl.*

Perennial *herbs*; branches rush-like, few-leaved. *Leaves* pinnately dissected, ultimate segments narrow. Rays of the *umbels* very short; bracts and bracteoles many, small; umbellules containing one central sessile fertile flower, and several pedicelled males. *Calyx-tube* hairy; teeth small, lanceolate, often unequal. *Petals* obovate, emarginate, hairy. *Fruit* oblong-lanceolate, hairy, terete (one carpel is frequently aborted), surrounded by the inflated pedicels of the barren flowers, receptacle not (or very obscurely) enlarged; carpophore 0; carpels $\frac{1}{2}$-terete, inner face deeply grooved; primary ridges filiform, minute, lateral at the margin of the broad commissure; vittæ numerous, very slender, usually 1 under each primary ridge and several still more minute scattered in the endocarp. *Seed* lunate or with a T-shaped groove on the inner face.—DISTRIB. Species 7, in N.E. Africa and W. and Central Asia.

Whether one or more flowers in each umbellule perfect seed is hardly a character of generic importance in this order, as may be seen in *Chærophyllum,* wherein *C. reflexum* is hardly separable specifically from *C. villosum.* If this point be withdrawn from the generic character of *Pycnocycla,* it will include *Seseli trilobum,* Benth.

1. **P. glauca,** *Lindl. in Royle Ill.* 232, t. 51; branches slightly pubescent, ultimate segments of the leaves long-linear subterete, umbels on long pubescent peduncles. *Hiern in Oliv. Fl. Trop. Afr.* iii. 8. P. abyssinica, *Hochst.*; *A. Rich. Fl. Abyss.* i. 333.

NORTH-WEST INDIA, *Royle*; Sutledge banks, *Falconer.* JUBBULPORE; *Beddome.* SATPURA HILLS, *G. Thomson.*—DISTRIB. Abyssinia.

Branched from the base, 1–2 ft.; branches terete, striate, subglaucous. Radical *leaves* long-petioled, pinnately dissected; segments remote, glabrous or nearly so; cauline similar, but smaller more shortly petioled. *Umbels* in flower $\frac{1}{2}$ in. diam., resembling those of a *Scabiosa*; bracts 5–6, $\frac{1}{3}$ in., oblong-linear or linear, hairy; bracteoles similar but smaller; rays $\frac{1}{3}$ in., hairy; pedicels hairy. *Flowers* in the umbellule about 9; petals white, with reddish midrib, hairy. *Fruit* $\frac{1}{3}$ by $\frac{1}{10}$ in.; carpel with a T-shaped groove on the inner face.—Beddome's examples have the two carpels producing perfect and similar seeds.

20. FŒNICULUM, *Adans.*

Glabrous *herbs*, biennial or perennial, tall. *Leaves* 2–3–4-pinnate, ultimate segments linear. *Bracts* 0; bracteoles 0, or few small linear. *Calyx-teeth* 0. *Petals* yellow, emarginate. *Fruit* not laterally compressed, oblong or ellipsoid; carpels ½-terete, ridges prominent subequal, furrows 1-vittate; carpophore 2-partite. *Seed* somewhat dorsally compressed, inner face slightly concave.—DISTRIB. Species 3–4, from the Canaries to Western Asia, 1 widely cultivated.

1. **F. vulgare,** *Gaertn. Fruct.* i. 105, t. 23, fig. 5; *DC. Prodr.* iv. 142; *W. & A. Prodr.* 371; *Wight Ic.* t. 515; *Kurz in Journ. As. Soc.* 1877, pt. ii. 115. F. officinale, *Allion.*; *Boiss. Fl. Orient.* ii. 975. F. dulce, *C. Bauh.*; *DC. l. c.*; F. Panmorium, *DC. l. c.*; *Wight Ic.* t. 570. Anethum Fœniculum, *Linn.*; *Roxb. Hort. Beng.* 22. A. Panmorium, *Roxb. Hort. Beng.* 22, *Fl. Ind.* ii. 94; *Fleming Cat. Ind. Med. Pl.* 6; *Wall. Cat.* 7211. Ozodia fœniculacea, *W. & A. Prodr.* 375.

Commonly cultivated throughout India, alt. 0–6000 ft.; often appearing wild.—DISTRIB. Widely cultivated.

The Indian examples have the ultimate segments of the leaves very long; the form *F. piperitum* DC.; *Boiss. Fl. Orient.* ii. 975; *Reich. Ic. Fl. Germ.* t. 1931 (with short linear ultimate segments) has not been communicated from India.

21. PRANGOS, *Lindl.*

Tall, perennial *herbs*. *Leaves* 3–4-pinnate. *Umbels* compound; bracts and bracteoles many. *Calyx-teeth* 0. *Petals* emarginate, yellow. *Fruit* oblong, commissure broad; carpels ½-terete, dorsally compressed, inner face nearly plane but the epicarp there thin, introflexed in a deep T-shaped groove; epicarp spongy; primary ridges large, subequal or the lateral larger; vittæ small, numerous; carpophore 2-partite. *Seed* dorsally compressed, inner face slightly concave, with a deep narrow T-shaped groove.—DISTRIB. Species 25, in the Mediterranean and West Asian regions.

1. **P. pabularia,** *Lindl. in Quart. Journ. Sc.* xix. (1824) 7; glabrous, ultimate segments of the leaves ½–1 in. setaceous, fruit ridges undulate furrows rough with corrugations. *DC. Prodr.* iv. 239; *Wall. Pl. As. Rar.* ii. 7, t. 212. Laserpitium sp. *Wall. in Trans. Agri. & Hort. Soc. Ind.* i. 74–82.

KASHMIR and BALTISTHAN, alt. 6000–11,000 ft., *Falconer*, &c.—DISTRIB. Cabul, Kashgar.

Stem 4–5 ft. *Leaves* 12–18 in., very compound. *Umbels* 6–18 in. diam., sometimes very compound. *Bracts* 4–8, ¾ in., linear. *Pedicels* 15–25, ⅙–⅓ in., whereof 4–8 may produce fruit. *Fruit* ¼–¾ in.; wings ⅛ in. broad; style-bases depressed; styles short, early reflexed. *Seed* $\frac{1}{12}$–$\frac{1}{10}$ in. diam.

22. ŒNANTHE, *Linn.*

Herbs, growing in wet places; root fibrous creeping or stoloniferous (in Indian species). *Leaves* 1–3-pinnate, ultimate segments large or linear or minute, rarely reduced almost to sheaths. *Umbels* compound; bracts 0–1 (in Indian species); bracteoles several linear. *Flowers* white, often polygamous, males sometimes radiant. *Calyx-teeth* small, acute. *Petals* emarginate. *Fruit*

glabrous, ellipsoid, longer than broad, or globose, nearly terete, commissure broad; carpels ½-terete, dorsally compressed, inner face plane; lateral primary ridges large, triangular, corky; dorsal and intermediate primary ridges much smaller, sometimes obsolete, or all subequal; furrows 1-vittate; carpophore 0; disc usually not prominent. *Seed* terete or dorsally compressed, inner face plane.—DISTRIB. Species 25, in the northern hemisphere and S. Africa.

1. **Œ. stolonifera,** *Wall. Cat.* 585; stoloniferous, stem long-decumbent often floating, leaves 1–2-pinnate secondary pinnæ lanceolate or rhomboid-lanceolate serrate or lobed scarcely half-way down, peduncles usually elongate. *DC. Prodr.* iv. 138; *Wight Ic.* t. 571; *Kurz in Journ. As. Soc.* 1877, pt. ii. 115. Œ. javanica, *DC. Prodr.* iv. 138. Phellandrium stoloniferum, *Roxb. Hort. Beng.* 21, *Fl. Ind.* ii. 93. Dasyloma latifolium, *Lindl. in Royle Ill.* 232. D. javanicum, *Miq. Fl. Ind. Bat.* i. pt. i. 741. D. sub-bipinnatum, *Miq. in Ann. Mus. Lugd. Bat.* iii. 59. Cyssopetalum javanum, *Turcz. in Bull. Soc. Nat. Mosc.* 1849, pt. ii. 25.

Northern INDIA from KASHMIR and the PUNJAB to ASSAM and PEGU; alt. 0–5000 ft., frequent; common in the plains of BENGAL.—DISTRIB. Java, China, Japan.

Glabrous or nearly so, 2–4 ft., rooting freely from many of the lower nodes. *Leaves* from 3-partite to 2-pinnate; ultimate segments 1–2 by ½–1 in., those of the upper leaves never linear. *Rays* 6–30, ½–2 in., stout. *Carpels* ⅛ by $\frac{1}{16}$ in., subquadrate-ellipsoid, sometimes shorter scarcely longer than broad; dorsal and intermediate ridges usually distinct, scarcely prominent. *Seed*, in horizontal section, nearly circular.—*Dasyloma japonica*, Miq. in Ann. Mus. Lugd. Bat. iii. 59, has the leaflets rather more lobed than any Indian examples, but is (*ex Maximowicz. ms.*) only a variety of *Œ. stolonifera*. From this *Œ. laciniatum*, Miq. Fl. Ind. Bat. i. pt. 741, does not appear to differ.

VAR. 1. *khasiana*; very large, secondary pinnæ large, nerves beneath reticulated elevated scabrid subpubescent, rays 3 in.—Khasia Mts., near Moflong, alt. 6000 ft., *H. f. & T.*—Calyx-teeth less prominent than in the type; bracteoles much exceeding the flowering umbellules.—This may be a distinct species; but the examples do not exhibit fruit.

VAR. 2. *corticata*, Edgw. in Trans. Linn. Soc. xx. 53 (sp.); leaves often simply 3-partite, fruit scarcely $\frac{1}{12}$ in. subglobose.—Banks of the Delhi Canal, *Edgeworth*.

2. **Œ. benghalensis,** *Benth. in Gen. Pl.* i. 906; roots fibrous, stem erect divided often from the base, leaves 2-pinnate secondary pinnæ lanceolate or ovate often deeply pinnatifid ultimate segments never linear, peduncles usually short often 0. *Kurz in Journ. As. Soc.* 1877, pt. ii. 115. Seseli benghalensis, *Roxb. Hort. Beng.* 22, *Fl. Ind.* ii. 94. Dasyloma benghalense, *DC. Prodr.* iv. 140; *Wight Ic.* t. 568. D. glaucum, *DC. Prodr.* iv. 140. Biforis benghalensis, *Wall. Cat.* 588. B. glauca, *Wall. Cat.* 587.

BENGAL PLAIN and ASSAM, common.—DISTRIB. Formosa, Bonin, Loo-choo.

Glabrous or nearly so; 8–16 in.; usually erect on muddy banks. *Secondary pinnæ* ¼–1 in., of the lower leaves often ovate, of the upper lanceolate. *Umbel* often sessile. *Bracts* 0; rays 4–6, rarely ¾ in., stout. *Calyx-teeth* small. *Carpels* $\frac{1}{12}$–$\frac{1}{10}$ by $\frac{1}{16}$ in., subquadrate ellipsoid; dorsal and intermediate ridges usually distinct scarcely prominent. *Seed* nearly terete.—The Indian specimens of *Œ. stolonifera* are readily separated from *Œ. benghalensis*. *Œ. stolonifera* is usually much larger with thickened hollow stems; the leaves are less compound, the rays more numerous and longer, the fruits longer. It is more difficult to separate the Chinese and Japanese specimens.

3. **Œ. linearis,** *Wall. Cat.* 586; stem decumbent, nodes rooting freely, leaves 2-pinnate ultimate segments of the upper ½–1 in. linear, peduncles and umbels nearly as in *Œ. stolonifera*. *DC. Prodr.* iv. 138.

NIPAL; *Wallich.*

Closely allied to *Œ. stolonifera*, and only differing in the more narrowly cut leaves, ultimate segments of the uppermost often $\frac{3}{4}$ by $\frac{1}{16}$–$\frac{1}{12}$ in. Wallich's specimens have no fruit. Mr. Bentham (in *Gen. Pl.* i. 906) has admitted this plant to specific rank.

4. **Œ. Hookeri,** *C. B. Clarke*; stem decumbent, nodes rooting, leaves mostly reduced to a fistular rachis with a very few remote pinnæ, pinnæ $\frac{1}{4}$ in. linear often 0.—Dasyloma sp. 1, *Herb. Ind. Or. H. f. & T.* Umbellifera, No. 985, *Griff. Itin. Notes* 57.

KHASIA MTS., alt. 5000–6000 ft.; *Griffith, H. f. & T., C. B. Clarke.*

Glabrous, or the rays sometimes pubescent. *Stem* 2 ft., erect, fistulous, scarcely divided. *Peduncles* elongate. *Bract* 1, $\frac{1}{3}$ in., linear, or 0; rays 4–8, $\frac{1}{2}$–$2\frac{1}{2}$ in.; bracteoles often longer than the flowering umbellule. *Calyx-teeth* obsolete. *Carpels* $\frac{1}{16}$–$\frac{1}{12}$ by $\frac{1}{12}$ in., almost exactly as in *Œ. benghalensis*, much smaller than in *Œ. fistulosa*, which this plant resembles in habit.

5. **Œ. Thomsoni,** *C. B. Clarke*; leaves finely 3–4-pinnate ultimate segments scarcely $\frac{1}{8}$ in. linear, peduncle elongate, carpels dorsally compressed.—Dasyloma sp. 2, *Herb. Ind. Or. H. f. & T.* Umbellifera, No. 1001, *Griff. Itin. Notes* 65.

SIKKIM and BHOTAN, alt. 5000–8000 ft., frequent. KHASIA MTS., alt. 4500–6000 ft., frequent.

Glabrous, 2–3 ft., weak, diffuse, branched. *Leaves* 6 in., ovate, sometimes 5-pinnate. Rays 4–8, $\frac{1}{2}$–$1\frac{1}{2}$ in.; bracteoles not prominent. *Carpels* $\frac{1}{12}$ by $\frac{1}{12}$ in. dorsally compressed, otherwise much resembling *Œ. benghalensis* and *Œ. Hookeri*. *Seed* dorsally compressed.

23. SCHULTZIA, *Spreng.*

Glabrous perennial *herbs*. *Leaves* 1–2-pinnate, ultimate pinnæ toothed pinnatifid or multifid. *Bracts* several, entire or divided; bracteoles numerous. *Calyx-teeth* prominent (in Indian species). *Petals* obovate, emarginate, white. *Fruit* ovate-oblong, commissure broad; carpels dorsally compressed; primary ridges slender; furrows 2–4-vittate; carpophore 2-partite.—DISTRIB. Species 3 in Central Asia, 1 in India.

1. **S.? Benthami,** *C. B. Clarke.* Pimpinella involucrata, *Miq. in Pl. Hohenack.* No. 657 *not of W. & A.*

CANARA; *Hohenacker.*

Calyx-teeth narrow-lanceolate, small. *Fruit* $\frac{1}{8}$–$\frac{1}{6}$ in. subquadrate, ellipsoid; ridges distinct, very slightly elevated, the two intermediate approximated to the dorsal. *Carpels* lunate, compressed, face somewhat excavate. *Seed* compressed, lunate, inner face concave.—The examples in ripe fruit have the aspect leaves and umbels of *P. involucrata*, W. & A., but the fruit (several still attached) is altogether different, and the plant is referred by Benth. (*in Gen. Pl.* i. 909) to *Schultzia* though the fruit does not quite fit that.—If not a *Schultzia*, the three approximate ridges on the back of the carpels must still bring the plant to this position in the Umbelliferous series.

24. POLYZYGUS, *Dalz.*

A glabrous herb; root tuberous. *Leaves* 2-pinnate or twice 3-partite, secondary pinnæ ovate lobed or deeply pinnatifid. *Umbels* compound; bracts 0, or few small; bracteoles few, small, linear. *Calyx-teeth* small, or the outer

slightly larger. *Petals* oblong, emarginate, white. *Fruit* ovoid, terete; commissure broad; primary ridges slender; furrows wide, 1–3-vittate; carpophore 2-partite. *Seed* ½-terete, dorsally compressed, inner face plane.

1. **P. tuberosus,** *Dalz. in Hook. Kew Journ.* ii. 260; *Dalz. & Gibs. Bomb. Fl.* 107.

BOMBAY and MALWA, *Dalzell*; CONCAN, *Stocks*; CANARA and MYSORE; *Law.*
Stems 8–18 in., several, weak. Secondary pinnæ of the *leaves* ½–1½ in., ultimate segments lanceolate or ovate. *Rays* 3–8, ½–1½ in.; pedicels 6–12, ⅙–¼ in. *Fruit* $\frac{1}{12}$ in.; style-bases depressed, inconspicuous.—This resembles a *Pimpinella*, but the habit is weak, straggling.

25. LIGUSTICUM, *Linn.*

Perennial *herbs*. *Leaves* 1–2–3-pinnate or twice 3-partite, ultimate pinnæ large minutely pubescent in the Indian species. *Umbels* compound, usually of many rays; bracts many, few, or 0; bracteoles many, rarely divided. *Calyx-teeth* obsolete. *Petals* obovate, emarginate, white. *Fruit* ovoid or ellipsoid, terete or dorsally subcompressed, commissure broad; carpels dorsally compressed, inner face plane; primary ridges very conspicuous, often subalate, subequal or the lateral wider; dorsal furrows at least 2-vittate, lateral at least 3-vittate; carpophore 2-partite. *Seed* dorsally compressed, about twice as broad as thick, inner face plane or slightly concave.—DISTRIB. Species 20, in the northern hemispheres.

1. **L. Thomsoni,** *C. B. Clarke*; leaves 1-pinnate pinnæ oblong lobed or pinnatifid, fruit ellipsoid terete, lateral ridges scarcely wider than the dorsal.—Oreocome sp. 2, *Herb. Ind. Or. H. f. & T.*

WEST TIBET, alt. 11,000–13,000 ft., *Thomson*.—DISTRIB. Afghanistan.
Nearly glabrous; top of the peduncle pubescent. *Stem* 2 ft. Lower *leaves* 6 by 2 in., oblong, primary pinnæ 1 by ¾ in., lobed, or sometimes deeply pinnatifid; upper leaves reduced nearly to sheaths, or small more finely cut. *Bracts* 5–8, ⅓–⅔ in., white-margined, deciduous; rays 10–20; bracteoles like the bracts but smaller. Fruit ⅛ by $\frac{1}{10}$–$\frac{1}{12}$ in.; ridges subalate; dorsal furrows 3–2-vittate, lateral 3-vittate, commissure 6–10-vittate.
VAR. *evolutior*; larger, leaves larger 2-pinnate nerves pubescent.—North Kashmir, alt. 6000–9000 ft., frequent. *Stem* usually 3–5 ft., often leafy upwards. *Umbel* very many-rayed, dense. *Fruit* exactly as in the type.

2. **L. marginatum,** *C. B. Clarke*; lower leaves pinnate pinnæ large deeply pinnatifid, carpels orbicular with prominent lateral ridges much dorsally compressed.

North-west HIMALAYA; alt. 7000–10,000 ft.; Simla and Naini Tal; *Thomson.*
Glabrous or nearly so, 2–4 ft., corymbose, nearly naked upwards. Lower cauline *leaves* 8–10 by 3 in., pinnæ 1–1½ in. deeply pinnatifid, lower sometimes subpinnate; segments oblong, serrate or lobed, often minutely pubescent. *Peduncles* long, pubescent upwards. *Bracts* 1–5, ¼ in., linear; rays 12–20, ½–1½ in.; bracteoles 4–8, ⅛–¼ in., linear. *Fruit* larger than in *L. Thomsoni*, the lateral ridges much wider than the dorsal; vittæ 3 in each furrow, 8 on the commissure. *Seed* 4–6 times as broad as thick, inner face slightly convex.—Undistinguishable from *L. Thomsoni* in the absence of fruit.

3. **L. elatum,** *C. B. Clarke*; lower cauline leaves 2-pinnate secondary pinnæ 1–3 in. ovate pinnatifid, fruit elliptic much dorsally compressed. Cortia

elata, *Edgw. in Trans. Linn. Soc.* xx. 55. ? Levisticum argutum, *Lindl. in Royle Ill.* 232.

North-west Himalaya; Simla, alt. 7000–8000 ft., *Edgeworth.* LAHUL; *Jaeschke.*
Stem 2–3 ft. Lower *leaves* 12 by 8 in., secondary pinnæ distant; upper pinnate or reduced to sheaths. *Bracts* 1–4, ¼ in., linear, or 0; rays 12–40, 1–1½ in.; bracteoles 6–12, ¼ in., linear; pedicels very many. *Fruit* ⅛–⅙ in., nearly as in *L. marginatum*, but the carpels are longer than broad; dorsal furrows 2–3-vittate, lateral 3-vittate, commissure 6–8-vittate. *Seed* 4–6 times as broad as thick, inner face plane.—Edgeworth's description is most accurate; the word *bivittatis* in the specific character being a misprint for *trivittatis.* He suggests that it may be the imperfectly described *Levisticum argutum*, Lindl.

26. SELINUM, *Linn.*

Perennial, branched herbs. *Leaves* pinnately compound. *Umbels* compound; rays numerous; bracts many, linear or pinnatifid, or few, small, or 0; bracteoles numerous, linear, serrate or pinnatifid, sometimes few small. *Calyx-teeth* obsolete, or lanceolate or linear. *Petals* obovate, emarginate, white or yellowish-green. *Fruit* ovoid or subquadrate, commissure broad, more or less dorsally compressed or complanate; lateral primary ridges winged, corky or papery, dorsal and intermediate ridges approximate, equal or unequal, as wide as the lateral or not, sometimes excurrent, not winged; dorsal furrows 1-vittate (or rarely 1 large deep-seated 2 small lateral superficial) or 0, lateral furrows 1–4 vittate; carpophore slender, 2-partite; style-bases not prominent in fruit. *Seed* subterete, or more or less dorsally compressed, inner face plane or slightly concave, not grooved.—DISTRIB. Species 35, chiefly north temperate, with a South African and Andean.

The Indian species are uniform in habit, having very compound leaves, large umbels with prominent involucres, three approximated ridges excurrent on the back of each carpel, and the seed not grooved on the inner face. *Ligusticum* differs by having the dorsal furrows 3-vittate. *S. tenuifolium* has the three dorsal ridges not excurrent, often subobsolete, and is therefore hardly different from *Angelica*. *Pimpinella sikkimensis* (p. 685) was referred to *Selinum* by Bentham.

1. **S. striatum,** *Benth. in Gen. Pl.* i. 914; ultimate segments of the leaves ⅙ in. narrowly oblong-lanceolate, fruit little dorsally compressed, ridges subequally winged, vittæ all solitary, seed about twice as broad as thick. Laserpitium striatum, *Wall. Cat.* 583 (*not* Ligusticum striatum, *DC. Prodr.* iv. 158).

NIPAL; *Wallich.* KHASIA MTS.; alt. 3500–6000 ft., abundant.
Glabrous or nearly so; 1–4 ft., frequently with many withered fibres at the base. *Leaves* 4–8 in., ovate, 3–4-pinnate, uppermost sheath often extending the whole length of the petiole. *Bracts* 4–6, ½–¾ in., linear: rays glabrous or obscurely pubescent; bracteoles 4–8, ¼ in., linear, minutely white on the margin, hardly serrate, not divided. *Calyx-teeth* linear, oblong, twice as long as broad. *Fruit* ⅛–⅙ in., lateral furrows 1-vittate, vittæ twice as wide as those in the dorsal; commissural vittæ 2, wide apart. *Seed* obscurely 2-grooved on the inner face.—Easily recognised by the little-compressed fruits and seeds. All the specimens are Khasian, except Wallich's, which have the ultimate segments of the leaves less narrowly cut, showing the secondary nerves impressed: the fruit is exactly as in the Khasian examples. In *Ligusticum striatum*, DC. Prodr. iv. 158, the furrows are multi-vittate. Bentham, l.c., assuming that DC. possessed the true *S. striatum*, points out that he was mistaken on this point. But DC. also says that his *Ligusticum striatum* had "leaves 2-pinnate the lobes acute entire seldom incised," so that his plant cannot be

referred to any Indian *Selinum.* Wallich must have distributed two plants mixed under one name in this as in so many other cases.

2. **S. tenuifolium,** *Wall. Cat.* 579, *chiefly*; ultimate pinnæ ½ in. broad-elliptic pinnatifid deeply into narrow lanceolate acute segments, fruit ⅕ in. much dorsally compressed, lateral ridges much the broadest, dorsal furrows 1-vittate lateral 2–3-vittate, seed 4–6 times as broad as thick. S. Candollii, *Edgw. in Trans. Linn. Soc.* xx. 55, *not of DC.* Peucedanum Wallichianum, *DC. Prodr.* iv. 181. Pleurospermum cicutarium, *Lindl. in Royle Ill.* 233. Oreocome Candolliana, *Edgw. l. c.*

Himalaya; alt. 6000–13,000 ft., from KASHMIR to BHOTAN, very common.

Stem 2–6 ft. Lower *leaves* often 1 ft., in outline ovate, usually 3-pinnate, tertiary pinnæ 1–2-pinnatifid, glabrous or pubescent; upper leaves reduced, sheath often as long as the petiole. *Bracts* 4–8, ¾–1½ in., linear, often toothed or slightly lobed, rarely pinnate; rays generally villous; bracteoles 5–12, often longer than the umbellule, white-margined, often lobed rarely pinnate or 2-pinnatifid. *Calyx-teeth* linear; carpels slightly elliptic, longer than broad; dorsally compressed, subcomplanate, 3 dorsal ridges approximate, often hardly elevated (whence DC. considered the plant a *Peucedanum*); commissural vittæ 4–6, distant from the medial line. *Seed* complanate, inner face plane or subconvex.

VAR. 1. *filicifolia*; quaternary pinnæ pinnatifid into more remote lobes. Oreocome filicifolia, *Edgw. in Trans. Linn. Soc.* xx. 55. ? Laserpitium coniifolium, *Wall. Cat.* 584.—Kashmir and N.W. Himalaya, alt. 6000–10,000 ft., frequent.—Wallich's *L. coniifolium* is without fruit and the leaves appear to belong to two species. *Ligusticum coniifolium,* DC. Prodr. iv. 158, from the description appears the same plant; DC. says that the furrows are multi-vittate; referring probably to the lateral ones, which have 2–4 vittæ.

VAR. 2. *elata*; quaternary pinnæ ½–1 in. broad-elliptic, fruit ¼ in. much dorsally compressed, dorsal and intermediate ridges distinctly winged, but less so than the lateral, dorsal furrows 1-vittate, lateral 2–3-vittate, seed 4 times as broad as thick. Oreocome elata, *Edgw. in Trans. Linn. Soc.* xx. 54.—North-west Himalaya, alt. 6000–10,000 ft.; from Kashmir to Kumaon; frequent.—This seems to differ from *S. tenuifolium* in the winged 3 dorsal ridges: the fruit also is somewhat larger. As regards Edgeworth's main character of "primary pinnæ of the upper leaves sessile at the apex of the sheath," it is common to *S. tenuifolium* and most other Indian species.

3. **S. Candollii,** *DC. Prodr.* iv. 165; quaternary pinnæ ½–¾ in. broad-elliptic pinnatifid deeply into narrow-lanceolate acute segments, fruit ¼ in. somewhat dorsally compressed, ridges all distinctly subequally winged, furrows all 1-vittate, seed 2½ times as broad as thick. Angelica ? Candollii, *Wall. Cat.* 582.

KASHMIR; alt. 7000–8000 ft., *Thomson.* NIPAL and KUMAON; *Wallich.* SIKKIM; alt. 12,000 ft., *C. B. Clarke.*

Stem, leaves, bracts and umbels generally like *S. tenuifolium*, but the fruit very distinct. *Fruit* subquadrate, longer than broad; 3 dorsal ridges approximate; *vittæ* in the lateral furrows solitary, but twice as broad as the dorsal, commissural 2, thick, somewhat widely separated. *Seed* convexo-concave, margins obtuse.

4. **S. vaginatum,** *C. B. Clarke*; secondary pinnæ mostly 1 in. lanceolate serrate scarcely lobed or pinnatifid, bracteoles 1–2-pinnate, fruit ⅕ in. dorsally compressed, ridges all winged the lateral more broadly, vittæ obsolete, seed 3 times as broad as thick. Cortia vaginata, *Edgw. in Trans. Linn. Soc.* xx. 55.

From KASHMIR to KUMAON, alt. 6000–12,000 ft., frequent.

Glabrous, or nearly so, 2–4 ft. *Leaves* 4–10 in., elliptic; lower like *Sium lati-*

folium; upper reduced; primary pinnæ sometimes sessile on the sheath. *Bracts* few, usually inconspicuous; bracteoles 8–12, ⅛–1½ in., usually exceeding the umbellule. *Calyx-teeth* long linear lanceolate. *Fruit* subquadrate, longer than broad, 3 dorsal ridges approximate. *Seed* plane on the inner face, or slightly concave.—The Herbarium specimens are largely mixed with fruits of *S. elatum*: and Edgeworth's descriptions of the fruit and bracteoles seem taken from these: the true plant has very large compound bracteoles, and the above description of the fruit is of ripe ones attached to unmistakable leaves. Mr. Bentham has referred it to *Ligusticum*, from the leaves approaching the Indian *Ligusticums* and the obsolete vittæ; but the compound bracteoles and long calyx-teeth refer it to *Selinum*.

5. **S. papyraceum,** *C. B. Clarke*; tertiary pinnæ ⅛ in. ovate serrate or half-pinnatifid into lanceolate segments, fruit ⅛ in. much dorsally compressed, lateral wings papery wider than the 3 dorsal, dorsal furrows 1-vittate lateral usually 2-vittate, seed in horizontal section elliptic twice as broad as thick.

From BALTISTHAN and KASHMIR to SIKKIM, alt. 8000–12,000 ft.; frequent.

Resembling *S. tenuifolium* so closely that it is difficult to separate until the fruit is nearly ripe: the leaves are usually less compound, the rays less villous, the bracteoles not white-margined. *Fruit* often longer than the umbellule, subquadrate, rather longer than broad, very strongly compressed; lateral ridges, quite unlike the white corky wings of the other Indian *Selinums*: 3 dorsal ridges very close together, usually very small, but in some examples the intermediate ridges are developed, nearly as wide as the lateral, the dorsal remaining minute. *Seed* very narrow compared with the breadth of the carpel, commissural vittæ close to the carpophore.

DOUBTFUL SPECIES.

?S. DISSECTUM, *Wall. Cat.* 581; leaves pinnate segments twice pinnatipartite, lobes linear-oblong acute, bracts 0, bracteoles few, flowers yellowish, fruit nearly orbicular narrowly margined, furrows 1-vittate, vittæ very distinct, commissural pair close to the carpophore. Peucedanum dissectum, *DC. Prodr.* iv. 178.—NIPAL; Gossain Than, *Wallich*. Habit of *Æthusa*.—The sheet in the Wallichian Herbarium contains—1, a good specimen in flower having 4–8 bracts and prominent bracteoles; 2, a young flowering specimen, exinvolucrate; 3, a detached umbel in fruit. DC.'s description, copied above, appears made up from 2 and 3, excluding 1; 1 certainly does not belong to 2, and it is possible that the fruit 3 belongs to neither.

27. CORTIA, *DC.*

Perennial *herbs*, often nearly stem-less. *Leaves* 3–4-pinnate, mostly radical, ultimate segments linear. *Umbels* compound, central one often sessile on the rootstock with numerous unequal rays; bracts rays and bracteoles many, often pinnate or 2-pinnate. *Calyx-teeth* prominent, sub-linear. *Petals* obovate, emarginate, white or purplish. *Fruit* orbicular or elliptic, much dorsally compressed; lateral ridges winged, dorsal and intermediate approximated much narrower sometimes hardly winged; dorsal vittæ solitary, lateral solitary or in pairs; carpophore 2-partite. *Seed* much dorsally compressed, inner face plane.—DISTRIB. Species 2; Himalayan.

This genus only differs from the Indian species of *Selinum* in the elongate unequal rays of the umbel; *C. Lindleyi* differs from all the *Selinums* by its compound pinnate bracteoles, *C. Hookeri*, by being stemless.

1. **C. Lindleii,** *DC. Prodr.* iv. 187; bracteoles 2-pinnate, styles of the fertile flowers short; fruit commissure 4-vittate. Schultzia? Lindlei, *Wall. Cat.* 589. Athamantha depressa, *Don Prodr.* 184 (*ex Wall. Herb.*).

From KUMAON to BHOTAN, alt. 12,000–16,000 ft; *Wallich*, &c.

Stem 0–8 in. *Leaves* glabrous or nearly so, ultimate segments rarely $\frac{1}{10}$ in., setaceous. *Umbel* often sessile; bracts (in the peduncled umbels) many large 2-pinnate; rays often pubescent, very unequal, sometimes 8–12 in. *Fruit* $\frac{1}{6}$–$\frac{1}{8}$ in.; carpels elliptic, slightly cordate at base; 3-dorsal ridges slightly equally winged, much narrower than the lateral: dorsal furrows 1-vittate, lateral usually 2-vittate. *Seed* 4–5 times as broad as thick.

2. **C. Hookeri,** *C. B. Clarke*; bracteoles long simple or slightly lobed, styles of the fertile flowers very long, fruit commissure 2-vittate.—Cortia sp. 1, *Herb. Ind. Or. H. f. & T.*

SIKKIM; alt. 13,000–18,000 ft., Donkiah, Jongri, &c., *J. D. H.*; Yakla, alt. 16,000 ft., *C. B. Clarke*; Phalloot, *S. Kurz.*

Stemless, with the fruit packed in dense masses over the crown, and a few long umbel-rays often added. *Leaves* glabrous or minutely pubescent, ultimate segments $\frac{1}{12}$–$\frac{1}{4}$ in., linear. *Rays* usually pubescent; bracteoles $\frac{1}{2}$–$\frac{3}{4}$ in.; pedicels of the fruit $\frac{1}{12}$–$\frac{1}{4}$ in., often ultimately thickened; umbellules generally unisexual, males with long stamens and obsolete styles. *Fruit* $\frac{1}{6}$ by $\frac{1}{5}$ in., depressed-circular, base cordate; 3 dorsal ridges slightly equally elevated, or the dorsal slightly winged, the intermediate nearly as broad as the lateral: furrows all 1-vittate, vittæ rather large. *Seed* 4–5 times as broad as thick.—The variation in the wings of the fruit of this species may be seen in one umbellule. But the great difference in the ultimate segments of the leaves is only seen in different plants, and may indicate two species: in one they are about $\frac{1}{12}$ in, in the other about $\frac{1}{4}$ in., and much more remote.

28. PLEUROSPERMUM, *Hoffm.*

Perennial or biennial *herbs,* glabrous or nearly so. *Leaves* 1–4-pinnate, ultimate pinnæ ovate, pinnatifid or multifid, setaceous. *Umbels* compound, rays many; bracts many, or few, often pinnatifid or compound, frequently white-margined; bracteoles many, broad, more or less white-margined, entire toothed or pinnatifid. *Calyx-teeth* small, or 0. *Petals* obovate, emarginate, white or dark purple. *Fruit* elliptic or oblong, terete or dorsally subcompressed; epicarp often lax; commissure broad; primary ridges winged, lateral narrower broader than the others; furrows 1-vittate, or the lateral 2-vittate, or vittæ many; carpophore 2-partite. *Seed* dorsally compressed, 2–3 times as broad as thick, inner face grooved concave or nearly plane.—DISTRIB. Species 16; Asiatic and Russian.

1. **P. Govanianum,** *Benth. in Gen. Pl.* i. 915; leaves pinnate pinnæ $\frac{1}{2}$–$1\frac{1}{2}$ in. toothed or pinnatifid, bracteoles obovate toothed or subpinnatifid at the apex, fruit $\frac{1}{6}$ in. lateral ridges narrowest. Ligusticum Govanianum, *Wall. Cat.* 546. Hymenolæna Govaniana, *DC. Prodr.* iv. 246; *Royle Ill.* 233, t. 52.

From KASHMIR to GURWHAL, alt. 10,000–15,000 ft., *Jacquemont*, &c,

Stem 1 foot or less, thick, hollow. *Leaves* 4–8 in., oblong, pinnæ often distant never finely cut, rarely deeply pinnatifid. *Bracts* 1–3 in., of an oblong entire white-margined sheath and divided often 2-pinnatifid limb; rays 1–5 in.; pedicels very many, short; umbellule capitate embraced by the bracteoles. *Fruit* ellipsoid or subquadrate; epicarp very lax, glistening, reticulate, ridges hollow, furrows 1-vittate. *Seed* distinctly grooved on the inner face.

2. **P. sikkimense,** *C. B. Clarke*; leaves pinnate rarely 2-pinnate pinnæ $\frac{1}{2}$–2 in. toothed or pinnatifid, bracteoles obovate toothed or subpinnatifid at the apex, fruit $\frac{1}{5}$ in. equally 5-ridged hardly winged, epicarp not loose.

SIKKIM, alt. 13,000–16,000 ft.; *J. D. H.*, *C. B. Clarke.*

Stem 2–24 in., thick, hollow. *Leaves* 4–8 in., oblong; pinnæ often distant, never finely cut. *Bracts* 1–1½ in., usually pinnatifid at the apex; rays 1–5 in.; pedicels very many, short; umbellules capitate and embraced by the bracteoles. *Fruit* narrow-oblong, rather broader upwards; calyx-teeth small; disc depressed; epicarp dull brown, somewhat corky; furrows 1-vittate. *Seed* concave or slightly grooved on the inner face.

3. **P. Candollii,** *Benth. in Gen. Pl.* i. 884, 916; leaves pinnate pinnæ ½–1½ in. toothed or pinnatifid, bracteoles elliptic or oblong entire, fruit ⅙ in. lateral ridges broadest, furrows 3–2-vittate. Ligusticum Candollii, *Wall. Cat.* 544. Hymenolæna Candollii, *DC. Prodr.* iv. 245. H. latifolia, *Lindl. in Royle Ill.* 233. H. pimpinellifolia, *Osten-Sacken & Ruprecht Sert. Tianschan*, 50.

From KASHMIR to KUMAON, alt. 10,000–15,000 ft.; frequent.—DISTRIB. Tianschan Mts.

Stem 6–18 in., usually very thick. *Leaves* 4–8 in., oblong; pinnæ often distant, never finely cut. *Bracts* 0–3 in., often like reduced upper leaves, sometimes a mere sheath; rays many, 2–8 in., sometimes carrying scattered white elliptic veined bracts; bracteoles obtuse, sometimes mucronate, embracing and usually overtopping the umbel. *Fruit* ellipsoid; ridges narrowly winged. *Seed* grooved on the inner face.—This has numerous vittæ, but the bracteoles and broad commissure are of *Pleurospermum.*

4. **P.? rotundatum,** *Benth. in Gen. Pl.* i. 915; leaves pinnate or 3-partite, leaflets of the lower 1–3 in. diam. with 3 rounded lobes, bracts 0 or 1 small, bracteoles 5–8 ¼ in. narrow-lanceolate caudate entire white-margined. Ligusticum rotundatum, *Wall. Cat.* 549. Hymenolæna rotundata, *DC. Prodr.* iv. 245.

NIPAL; Gossain Than, *Wallich.*

Stem 2 ft., not very thick. *Leaflets* 3–5, petioluled, distant, entire or crenate, scarcely serrate, more often with 3 rounded lobes. *Rays* 8–12, 1–1½ in.; pedicels 8–16, some as long as the bracteoles. *Calyx-teeth* 0. *Disc* and *styles* small. Young *fruit* subcylindric with incipient ridges.—Wallich's examples show no ripe fruit, so that the genus is doubtful. The elongate not thick stem, the subobsolete bracts, and the little-prominent bracteoles do not look like *Pleurospermum.*

5. **P. Benthami,** *C. B. Clarke*; leaves pinnate or sub-2-pinnate pinnæ 1–3 in. deeply lobed, bracteoles oblong toothed scarcely pinnatifid at the apex, fruiting pedicels ½–1½ in., fruit ⅕–¼ in., lateral ridges widest. Ligusticum Benthami, *Wall. Cat.* 542. Hymenolæna Benthami, *DC. Prodr.* iv. 246.

NIPAL; Gossain Than, *Wallich.*

Stem 2–3 ft. *Pinnæ* pinnatifid; lobes distant, large, coarsely serrate *Bracts* 4–6, 1–1¾ in., oblong, coarsely lobed or pinnatifid at the apex; rays 4–12, 1–2½ in. *Fruit* ellipsoid, dorsally compressed; calyx-teeth obsolete, style-bases somewhat prominent; furrows 1-vittate. *Seed* broadly concave on the inner face, hardly grooved.

6. **P. angelicoides,** *Benth. in Gen. Pl.* i. 915; leaves 1–2-pinnate pinnæ 3–6 in. with oblong segments, bracteoles 5–8 ¾ in. narrow-lanceolate entire, fruit ½ in. narrowly oblong. Ligusticum angelicoides, *Wall. Cat.* 548. Hymenolæna angelicoides, *DC. Prodr.* iv. 245. Pterocyclus angelicoides, *Klotzsch in Reis. Pr. Waldem. Bot.* 150, t. 47.

KASHMIR; *Falconer.* KUMAON; Rutam River, alt. 11,500 ft., *Strachey & Winterbottom.* NIPAL; *Wallich.*

Stem 3–4 ft. *Leaves* 12–18 in.; segments of the secondary pinnæ often 1–3 in.,

serrated somewhat closely and regularly. *Bracts* 5-8, 1-1¾ in., narrowly-lanceolate, entire, white-margined; rays 10-20, 1-4 in.; pedicels in fruit ½-¾ in., often exceeding the bracteoles. Ridges of the *carpels* thin, narrowly winged, lateral rather the broadest.—The fruit is dorsally compressed; Klotzsch's figure must have been taken from very immature fruit, and does not show correctly the shape of the carpel in horizontal section at any period.

7. **P. dentatum,** *Benth. in Gen. Pl.* i. 915; leaves 2-pinnate pinnæ ½-2 in. ovate, bracteoles 5-8 ½ in. lanceolate entire or minutely denticulate near the apex, fruit ¼ in. ellipsoid. Ligusticum dentatum, *Wall. Cat.* 547. Hymenolæna dentata, *DC. Prodr.* iv. 245.

From KUMAON to SIKKIM, alt. 9000-13,000 ft., *Wallich*, &c.

Stem 2-4 ft. Segments of the *pinnæ* ½ in., oblong or ovate, serrate. *Bracts* 3-0, 1 in., lanceolate, white-margined; rays 5-15, 1-3 in.; bracteoles usually undulate on the margin, crenulate or denticulate, or quite entire; pedicels in fruit usually shorter than the bracteoles. *Carpels* elliptic, dorsally compressed; ridges thin, narrowly alate, lateral broadest; dorsal furrows 1-vittate, lateral 2-vittate; commissure plane, 4-vittate; calyx-teeth 0; style-bases not prominent. *Seed* very obscurely concave on the inner face, or plane.—*Cnidium cuneatum*, Ledeb. Fl. Alt. i. 331 (Aulacospermum, *Ic. Fl. Ross.* iv. 7, t. 312) appears the same, but the authentic example is in young flower only. It is said to differ by the upper branches and leaves being opposite and whorled: but this is occasionally seen in many species of *Pleurospermum. P. dentatum*, in the absence of fruit, is very difficult to distinguish from *P. angelicoides*; but the leaves and leaflets are generally smaller, the bracteoles lanceolate (rather than narrow-lanceolate) and slightly crenulate or serrulate. In defining the area of the species; all Sir J. D. Hooker's examples distributed as *P. angelicoides* have been referred to *P. dentatum*; though the leaflets are large, the fruit is small, and the bracteoles distinctly serrulate.

VAR. *erosa*, *DC. l. c.*; bracts 4-5, leaflets more irregularly incise-serrate.—Mixed with the type as DC. states. There appear two states of the bracts, and two very differently cut leaves; the latter may indicate a different species as DC. suggests, but the typical *P. dentatum* has sometimes many bracts.

8. **P. pumilum,** *Benth. in Gen. Pl.* i. 915; leaves pinnate pinnæ ½-1 in. ovate lobed or subpinnatifid, bracts 1-2 small linear or 0, bracteoles 3-7 ¼ in. linear entire obscurely white-margined. Ligusticum pumilum, *Wall. Cat.* 550. Hymenolæna pumila, *DC. Prodr.* iv. 245.

NIPAL; *Wallich*. SIKKIM; Islumbo, alt. 11,000 ft., *C. B. Clarke*.

The specimens are without fruit. The species is very near *P. dentatum*, and differs only in the subobsolete bracts and very narrow bracteoles. The Sikkim example must have been at least 3 feet high, so that the name *pumilum* is not well applied to the species.

9. **P. stylosum,** *C. B. Clarke*; leaves 2-pinnate pinnæ 1-3 in. often pinnatifid, bracteoles 6-10 lanceolate entire or incise-serrate at the apex, fruit ⅛ in. subglobose transversely plicate-rugose.

KASHMIR; *Falconer*. LAHUL; alt. 11,000-12,000 ft., *Rev. H. Jaeschke*.

Stem 2-4 ft. Segments of the secondary *pinnæ* ½-1 in., pinnatifid or serrate. *Bracts* 4-6, 1-3 in., lobed or pinnatifid at the apex; rays 10-35, 1½-3 in.; bracteoles white-margined, entire, incised or lobed in the same umbel. *Fruit* slightly longer than broad; epicarp of very lax tissue (as in *P. Govanianum*) the transverse folds occupying the whole back except the ridges; style-bases prominent even on the ripe fruit; calyx-teeth obsolete; ridges subequal, hardly winged.

10. **P. stellatum,** *Benth. in Gen. Pl.* i. 915; leaves 1-2-pinnate pinnæ ¼ in. serrate or pinnatifid with small narrowly lanceolate lobes, bracteoles 5-8

oblong white-margined obtuse lobed or very shortly pinnatifid at the apex, fruit $\frac{1}{8}$ in. ellipsoid somewhat longer than broad, epicarp of very lax tissue, seed grooved on the inner face. Selinum stellatum, *Don Prodr.* 185; *DC. Prodr.* iv. 165. Hymenolæna stellata, *Lindl. in Royle Ill.* 233.

North-west HIMALAYA; *Royle.* KUMAON; Milam Glacier, alt. 13,000 ft., *Strachey & Winterbottom.*

Stem 1–6 in. *Leaves* 2–4 in., oblong; pinnæ ovate, acutely serrate, or subflabellately pinnatifid or nearly 2-pinnate with mucronate lobes. *Bracts* 1–4, $\frac{1}{2}$–$1\frac{1}{2}$ in., pinnatifid; rays 3–5, 1–6 in., glabrous; pedicels very short. *Fruit* dorsally compressed; style-bases globose, depressed; calyx-teeth obsolete; petals often persistent. *Carpels* plane on the inner face; lateral ridges hardly so wide as the intermediate and dorsal, all obtuse, hollow; epicarp rugose, but hardly plicate; furrows 1-vittate.

VAR. *Lindleyana*; bracteoles entire or slightly lobed, leaves often 2-pinnate ultimate segments oblong or obovate obtuse. Hymenolæna Lindleyana, *Klotzsch in Reis. Pr. Waldem. Bot.* 150, t. 49. H. nana, *Osten-Sacken & Ruprect Sert. Tianshan.* 49. Hymenolæna, sp. No. 9, *Herb. Ind. Or. H. f. & T.* ? Aulacospermum simplex, *Ost. & Rup. l. c.*—West Himalaya, alt. 13,000–16,000 ft.; Kashmir, *Thomson.* LAHUL; *Rev. H. Jaeschke.*—Distrib. Karakorum (Northern slope); Tianschan Mts.—Except as to the obtuse (not mucronate) ultimate segments of the leaflets, there seems no difference between this and *P. stellatum* type. Of *Aulacospermum simplex*, the authentic example has the fruit not half-ripe, the bracteoles are rather smaller.

11. **P. apiolens,** *C. B. Clarke*; leaves pinnate pinnæ $\frac{1}{2}$–$1\frac{1}{2}$ in. ovate often pinnatifid with 3–5–7 lobes, bracteoles 6–10 obovate caudate often toothed near the apex, calyx-teeth obsolete, fruit $\frac{1}{8}$–$\frac{1}{6}$ in. ellipsoid subquadrate.—Hymenolæna sp. 10, *Herb. Ind. Or., H. f. & T.*

Interior valleys of SIKKIM. alt. 11,000–14,000 ft.; *J. D. H.*; *Elwes*; *C. B. Clarke.*

Stem 3–18 in. *Leaves* 4–8 in., oblong, mucronate-serrate. *Bracts* 4–5, $\frac{3}{4}$–$1\frac{1}{4}$ in., obovate-lanceolate, toothed, sometimes slightly pinnatifid, rarely subentire; rays 8–16, 1–2 in.; pedicels many, scarcely $\frac{1}{4}$ in. in fruit, much shorter than the bracteoles. *Carpels* dorsally compressed; epicarp loose but not of open tissue; ridges narrowly winged, subequal; furrows 1-vittate. *Seed* twice as broad as thick, inner face exactly plane.—Smells of celery (J. D. H.).

12. **P. Hookeri,** *C. B. Clarke*; leaves 2–3-pinnate ultimate pinnæ $\frac{1}{4}$–$\frac{1}{2}$ in. ovate or oblong toothed or pinnatifid, bracteoles 6–10 obovate-lanceolate subentire white-margined, calyx-teeth ovate.—Hymenolæna sp. 8, *Herb. Ind. Or., H. f. & T.* Oreocome sp. 1, *Herb. Ind. Or. H. f. & T.*

SIKKIM, alt. 10,000–16,000 ft.; *J. D. H.*

Stem 8–20 in. *Leaves* 6–12 in., ovate, mucronate-serrate. *Bracts* 4–7, 1–$1\frac{1}{2}$ in. lanceolate, often toothed or pinnatifid at the apex; rays 4–8, 1–3 in.; pedicels very many, $\frac{1}{4}$–$\frac{1}{3}$ in., shorter than the bracteoles. *Petals* persistent. *Fruit* not ripe, but will be nearly as in the var. *Thomsoni.*

VAR. *Thomsoni*; bracteoles narrowly lanceolate (not at all obovate) narrow and narrowly white-margined often not prominent. WEST TIBET, alt. 14,000–16,000 ft., *Thomson*; Shelshed River, alt. 15,500 ft., *Strachey & Winterbottom.*—*Fruit* $\frac{1}{8}$ in., ellipsoid; epicarp loose but not of open tissue; ridges thin, narrowly winged, lateral a little broadest. *Seed* plane on the inner face or nearly so.—United with *P. Hookeri* by H. f. & T. in Herb. and it agrees with it as to the ovate calyx-teeth, but differs in the much smaller bracteoles and the remote locality. It has been placed next *Selinum tenuifolium* by H. f. & T. (mss.) and its bracts and bracteoles are hardly more prominent than in that species: but *P. Hookeri* type must be placed in *Pleurospermum*, which here touches *Selinum.*

13. **P. densiflorum,** *Benth. in Gen. Pl.* i. 916; leaves 3–4-pinnate ultimate segments very narrowly lanceolate or linear, bracteoles 5–8 elliptic entire or somewhat pinnatifid at the apex, fruit $\frac{1}{5}$–$\frac{1}{4}$ in. with 5 subequal somewhat broad ridges, seed distinctly grooved on the inner face. Hymenidium ? densiflorum, *Lindl. in Royle Ill.* 233. ? H. suaveolens, *Klotzsch in Reis. Pr. Waldem. Bot.* 148, t. 48.

North-west HIMALAYA; *Royle*. KASHMIR, alt. 11,000–14,000 ft., *Levinge, C. B. Clarke*. GURWHAL, *Falconer*.

Stem 6–15 in. *Leaves* 3–4 in., ovate. *Bracts* 5–6, 1–2 in., oblong, tips usually pinnatifid or pinnate; rays 5–12, 1–2 in.; bracteoles prominently white-margined, exceeding the umbellule, often entire obtuse with the green midrib subexcurrent. *Calyx-teeth* obsolete. *Fruit* ellipsoid subquadrate, nearly terete; epicarp thin, loose, not of lax tissue; dorsal furrows 1-vittate, lateral 2-vittate, commissure 4-vittate. *Carpels* plane on the inner face. *Seed* about twice as wide as thick.—Hardly distinguishable from *P. Brunonis* but by the larger more winged fruit: it is doubtful to which of these species *H. suaveolens* belongs, the drawing being made from immature fruit: the leaves of *P. Brunonis* are usually more finely cut than as in Klotzsch's figure.

14. **P. Brunonis,** *Benth. in Gen. Pl.* i. 916; leaves 3–4-pinnate ultimate segments setaceous, bracteoles 5–8 elliptic or obovate often pinnatifid at the apex, fruit $\frac{1}{8}$–$\frac{1}{6}$ in., dorsal and intermediate ridges narrowest, seed exactly plane on the inner face. Ligusticum Brunonis, *Wall. Cat.* 545. Hymenolæna Brunonis, *DC. Prodr.* 245. Hymenidium Brunonis, *Lindl. in Royle Ill.* 233.

From KASHMIR to NIPAL. alt. 9000–14,000 ft., frequent.

Closely resembling *P. densiflorum* except as to the smaller fruit. *Fruit* ellipsoid subquadrate, much dorsally compressed; epicarp thin, loose, not of open tissue; furrows all 1-vittate, commissure 2-vittate; carpels plane on the inner face. *Seed* 4–5 times as wide as thick.—Bentham not having seen ripe fruit doubted the seed being plane on the inner face as described by Lindley and upon which character he founded the genus *Hymenidium*.

29. ANGELICA, *Linn.*

Herbs, usually tall. *Leaves* 1–2–3-pinnate, pinnæ toothed, usually large. *Umbels* compound, rays many; bracts few, narrow, or 0; bracteoles small. *Calyx-teeth* obsolete. *Petals* obovate, emarginate, white or lurid-purple. *Fruit* ovoid or ellipsoid, dorsally compressed, commissure broad; lateral ridges broadly winged, dorsal and intermediate not prominent; carpels complanate, broadly margined; furrows 1–2-vittate; carpophore 2-partite. *Seed* much dorsally compressed, inner face plane concave or almost grooved.—DISTRIB. Species 18 in the north-temperate and arctic regions, and New Zealand.

1. **A. glauca,** *Edgw. in Trans. Linn. Soc.* xx. 53; leaves twice or thrice 3-partite or 2-pinnate, leaflets few 1–3 in. ovate serrate glaucous beneath.

From KASHMIR to SIMLA, alt. 8000–10,000 ft., *Falconer*, &c.

Glabrous, 4–12 ft. *Bracts* several, 1 in., linear; bracteoles many, $\frac{1}{4}$ in. *Rays* often 20–30, 1–3 in., equal; pedicels hardly half as long as the fruit. *Fruit* $\frac{1}{3}$ by $\frac{1}{4}$ in., subquadrate; dorsal and intermediate ridges approximate, rounded, somewhat corky; furrows 1-vittate; commissure 2–4-vittate; carpels plane on the inner face. *Seed* less than $\frac{1}{16}$ in. wide, but about twice as wide as thick; almost grooved on the inner face.

30. **ARCHANGELICA,** *Hoffm.*

Tall perennial *herbs*. *Leaves* 2–3-pinnate, ultimate pinnæ toothed, usually large. *Umbels* compound, rays many; bracts few, small, or 0; bracteoles many, linear, or obsolete. *Calyx-teeth* obsolete (in India). *Petals* ovate, subentire, white. *Fruit* ellipsoid, subquadrate, or oblong; commissure broad; carpels dorsally compressed, lateral ridges winged or acute, dorsal and intermediate narrower, distinct; vittæ many; carpophore 2-partite. *Seed* dorsally much compressed, inner face plane.—DISTRIB. Species 5, in North Temperate regions.

1. **A. officinalis,** *Hoff. Pl. Umb. Gen.* i. 168; leaflets 1½–4 by ¾–2 in., bracteoles as long as the flowering umbellule, fruit ¼ in. *DC. Prodr.* iv. 169. A. decurrens, *Ledeb. Ic. Fl. Ross.* ii. 21, t. 166. Angelica Archangelica, *Linn.*

VAR. *himalaica*; flowers twice as large, fruit ⅓ by ⅕ in.

KASHMIR; 8–13,000 ft., *C. B. Clarke*; *Aitchieson.* JOGI; alt. 11,000 ft., *Thomson.* SIKKIM; Lachen, alt. 10,000–11,000 ft., *J. D. H.*—DISTRIB. (of the type) North Europe, Asia, and America.

Stem 5–10 ft. *Leaves* 1–3 ft., ovate, ultimate pinnæ sessile, rarely decurrent, terminal often 3-lobed. *Bracts* small; rays 10–30, 1½–4 in.; *pedicels* very numerous, ¼–½ in. Lateral ridges usually winged; pericarp somewhat corky, easily separating from the seed; vittæ numerous, small, on the inner surface of the pericarp.—The fruit of the Himalayan variety is much larger than that of any other *Archangelica* preserved at Kew. It closely resembles the flowering example of *A. decurrens*, but in Ledebour's figure of that species its fruit is no larger than in ordinary *A. officinalis*.

31. **FERULA,** *Linn.*

Perennial *herbs*. *Leaves* 2–4-pinnatifid or 2–4-pinnate. *Umbels* compound. *Flowers* yellow, often polygamous. *Calyx-teeth* obsolete. *Petals* ovate, obtuse, or emarginate. *Fruit* orbicular or ellipsoid, much compressed dorsally; lateral ridges winged, dorsal and intermediate filiform or obscure; vittæ many or few; carpophore 2-partite. *Seed* much dorsally compressed, inner face plane.—DISTRIB. Species 60, in Europe, N. Africa, Central Asia.

Ferula is difficult to separate from *Peucedanum*. The Indian species all belong to the section *Narthex*.

SECT. **Narthex,** *Falconer* (Gen.) Segments of the *leaves* 1–4 in., oblong, often pubescent. *Bracts* 0, or small, deciduous: bracteoles 0, or very small. Dorsal furrows 1-vittate (rarely a small vitta added); lateral 1–2-vittate; commissure 2–14-vittate.

1. **F. Narthex,** *Boiss. Fl. Orient.* ii. 994; secondary and tertiary pinnæ decurrent entire or very irregularly crenate-serrate, ovary glabrous, fruit ⅓ by ⅕ in., vittæ manifest broad 1 (rarely 1–2) in the dorsal furrows. *Flück. & Hanb. Pharm.* 280; *Bentl. & Trim. Med. Pl.* t. 126. Narthex Asafœtida, *Falc. in Trans. Linn. Soc.* xx. 285; *Bot. Mag.* t. 5168; *Balf. in Trans. R. Soc. Edinb.* xx. 366, tt. 21, 22.

BALTISTHAN; Astor, *Falconer.*

Stem 5–8 ft. *Leaves* pubescent, at least when young; lower leaves 1–2 ft., ovate, cauline sheaths large, from which spring simple or scarcely compound umbels. Terminal *umbel* large, compound, leafless. *Vittæ* broad, usually occupying the whole furrow, and as long as the carpel; commissural usually 4, 2 slender sometimes added.

—This is certainly not *F. Asafœtida, Boiss. l. c.*, which is *Scorodosma fœtidum, Bunge in Borcz. Ferul.* tt. 1, 2, with hairy ovary and many very minute (or 0) vittæ. Whether it is the *F. Asa-fœtida* founded by Linnæus on the figure in *Kæmpf. Amœn.* p. 536, is a disputed point. That figure does not represent the numerous lateral subsimple umbels arising from the sheaths of the cauline leaves which characterise this, but this character varies so in *F. Jaeschkeana* (No. 3) that it is impossible to rely upon it. The fragments of Kæmpfer's plant preserved in the British Museum do not suffice to determine the point. *T. Thomsoni* (No. 2) has the subsimple umbels of Falconer's plant (in cultivation), and has also a divaricate corymb very like that figured by Kæmpfer.

2. **F. Thomsoni,** *C. B. Clarke*; glabrous, tertiary pinnæ 2 by ½ in. subentire mostly petioluled, inflorescence as in *F. Narthex.*—Dorema No. 5, *Herb. Ind. Or. H. f. & T.*

KASHMIR; Banahal, alt. 5000–6000 ft., *Thomson.*

Resembling *F. Narthex*, but with leaves cut into remote lanceolate subacute leaflets.—Thomson's examples are in flower, but a fruiting corymb of this, or an allied *Ferula*, from Kashmir at Nowgunge (alt. 8000 ft., C. B. Clarke), has umbels and flowers as in the terminal umbel of *F. Narthex*; pedicels ⅙–¼ in., clavate at the apex; carpels ⅓ by ¼ in., much compressed, elliptic narrowed at both ends, plane or almost convex on the inner face: dorsal and intermediate ridges filiform, lateral narrowly winged; vittæ 3–2 in the dorsal furrows, minute, as long as the carpel, and seeds very much compressed.

3. **F. Jaeschkeana,** *Vatke Append. in Sem. Hort. Berol.* 1876, 2; secondary and tertiary pinnæ decurrent regularly closely crenate, carpel ⅝ by ⅜ in., vittæ very large solitary in each furrow. F. fœtidissima, *Regel & Schmalh. in Gartenfl.* 1878, 195–198, t. 944.—Dorema sp. 3 and 4, *Herb. Ind. Or. H. f. & T.*

KASHMIR; alt. 6000–12,000 ft., plentiful; *Falconer, Thomson,* &c.—DISTRIB. Turkestan.

Stem, leaves, and inflorescence as in *F. Narthex*, except that the leaves are closely crenate or doubly crenate or almost serrate. As in *F. Narthex*, the fruiting corymb often appears elongate subpaniculate, sometimes divaricate and corymbose; peduncles bearing nearly simple umbels also proceed from the large sheaths of the cauline leaves. *Fruit* much larger and thicker than in *F. Narthex*, vittæ much the largest of any Indian umbellifer: the commissural often 2 only near the medial line, sometimes 4 or 6.—Regel and Schmalh. think that this plant probably produces the Asafœtida of commerce; this may be so, as it is an abundant species in Kashmir, and very largely supplied with oil: but it is not the Asafœtida of Linnæus, because Kæmpfer's figure has entire not crenate leaflets.

32. PEUCEDANUM, *Linn.*

Perennial glabrous or pubescent herbs (the Indian species). *Leaves* 1–3-pinnate or twice or thrice 3-partite, ultimate leaflets lanceolate or ovate, rarely linear, toothed or entire. *Umbels* compound, rays usually numerous; bracts various, bracteoles many few or 0. *Flowers* often polygamous, white or yellow, rarely pink. *Calyx-teeth* obsolete or small. *Petals* obovate, emarginate or 2-fid. *Ovary* glabrous. *Fruit* much dorsally compressed, ellipsoid, oblong, or orbicular, carpels scarcely convex on the back, more or less acutely winged on the margin, dorsal and marginal ridges little elevated or obsolete, lateral winged; dorsal furrows 1-vittate, lateral 1- rarely 2-vittate. *Seed* much dorsally compressed, inner face plane.—DISTRIB. Species 100, throughout nearly the whole world, few tropical.

The species (formerly referred to *Pastinaca*) having the ovary and young fruit hairy have been transferred by Mr. Bentham to *Heracleum*, whether the vittæ are abbreviated or not.

*. *Ultimate segments of the leaves ½–1 in., linear.*

1. **P. graveolens,** *Benth. in Gen. Pl.* i. 919; bracts and bracteoles 0, petals yellow, fruit $\frac{1}{6}$ by $\frac{1}{12}$ in. narrowly winged plano-convex 2–3 times as broad as thick. P. Sowa, *Kurz in Journ. As. Soc.* 1877, pt. ii. 116. Anethum graveolens, *Linn.*; *DC. Prodr.* iv. 186; *Wall. Cat.* 7210; *Boiss. Fl. Orient.* ii. 1026. A. Sowa, *Roxb. Hort. Beng.* 22, *Fl. Ind.* ii. 94; *Fleming Cat. Ind. Med. Pl.* 5; *Wall. Cat.* 595; *DC. Prodr.* iv. 186; *W. & A. Prodr.* 372; *Wight Ic.* t. 572.

Throughout tropical and subtropical INDIA; often cultivated.—DISTRIB. Cultivated in S. Europe and W. Asia.

Glabrous, 1–3 ft. *Leaves* 2–3-pinnate. *Pedicels* many, ½ in. *Styles* small. Dorsal and intermediate ridges distinct, slender; vittæ large, solitary in each furrow, 2 on the commissure.—The fruits are as broad and as much winged in the Indian *P. Sowa* as in the ordinary *P. graveolens*: never subobsolete, as shown in *Wight Ic.* t. 572. In the European *P. graveolens* the carpels are plano-convex, and not so subpentagonal as depicted by Reichenbach, as Bentham has observed *l. c.*

** *Ultimate segments of the leaves ½–2 in., linear-oblong or ovate, entire or remotely sparingly toothed; bracts* 0 *or very small.*

2. **P. Dhana,** *Ham. in Wall. Cat.* 7216; leaves twice or thrice 3-partite or sub-2-pinnate leaflets 2 by ¼ in. sessile usually entire, carpels ¼ by $\frac{1}{6}$ in.

NORTH-WEST INDIA; Sub-sewaliks up to 4500 ft.; *Edgeworth.* KUMAON, in the subtropical region; *Strachey & Winterbottom.* NORTH BENGAL; Goruckpore, *Hamilton*; Dinajpur, *C. B. Clarke.*

Glabrous, 6–24 in., subnude upwards. *Bracts* 3–5, ¼ in., linear or linear-lanceolate; rays 5–10, 1–2½ in.; bracteoles 4–8, $\frac{1}{8}$ in., linear; pedicels numerous ¼ in. *Flowers* small, yellow. *Calyx-teeth* obsolete. *Styles* somewhat long. *Carpels* greatly compressed, subquadrate, tip obtuse, often truncate or emarginate; dorsal and intermediate ridges filiform, subobscure, lateral with a wing as thick as the seed; dorsal furrows 1-vittate lateral 2-vittate; vittæ nearly as long as the carpel, commissural 6–4.

VAR. *Dalzellii*; leaflets shortly oblong or suborbicular. Pastinaca glauca, *Dalz. in Hook. Kew Journ.* iv. 293; *Dalz. & Gibs. Bomb. Fl.* 107.—Belgaum, *Dalzell, Ritchie.* Jubbulpore, *McLeod.* Chota Nagpore, *C. B. Clarke.*—Leaflets usually 1 by ½–⅔ in., very unlike those of *P. Dhana*, but the plants in every other point agree. There has been considerable confusion between *Pastinaca glauca*, Dalz. (*Peucedanum*, sp. Benth.) and *Peucedanum glaucum*, Wall.: two widely different plants.

*** *Ultimate segments of the leaves linear- or ovate-lanceolate serrate; bracts* 0 *or very small.*

3. **P. ramosissimum,** *Wall. Cat.* 578; segments of the lower leaves ovate-lanceolate of the upper narrow-lanceolate, pedicels in fruit $\frac{1}{6}$–⅓ in., fruit ¼ by $\frac{1}{8}$–$\frac{1}{6}$ in. winged commissure evittate. Palimbia ramosissima, *DC. Prodr.* iv. 176.

KHASIA MTS., alt. 4000–6000 ft., common.

Glabrous, 2–5 ft. *Leaves* 2–4-pinnate, much and acutely serrate. *Bracts* 0, or 1–3, ¼ in.; rays 4–8, ½–1½ in., divaricate; bracteoles 0–5, $\frac{1}{8}$ in., linear; pedicels 5–10. *Calyx-teeth* minute. *Styles* very short. *Carpels* elliptic, narrowed at both ends, entire or subemarginate at the apex: dorsal and intermediate ridges obscure,

wings of lateral as thick as the seed; furrows 1-vittate; vittæ nearly or quite as long as the carpel.

4. **P. sikkimense,** *C. B. Clarke*; segments of the lower leaves ovate-lanceolate of the upper narrow-lanceolate, pedicels in fruit $\frac{1}{4}$–$\frac{3}{4}$ in., fruit $\frac{1}{4}$–$\frac{1}{3}$ by $\frac{1}{6}$–$\frac{1}{4}$ in. broadly winged deeply emarginate at both ends, commissure evittate.

SIKKIM; alt. 3000–7000 ft., frequent; *J. D. H.*, *C. B. Clarke.*
Resembling *P. ramosissimum* closely except as to the fruit, which has a broader wing; the seed is not larger than in that plant, but the pedicels are usually longer and more slender, and there are often no bracteoles.

5. **P. anamallayense,** *C. B. Clarke*; segments of the leaves very narrowly lanceolate, pedicels in fruit $\frac{1}{6}$–$\frac{1}{3}$ in., fruit $\frac{1}{5}$ in. orbicular commissure 6–4-vittate.

ANAMALLAY MTS.; *Wight, Beddome.*
Resembling *P. ramosissimum*, but the segments of the leaves narrower, the fruit different. *Umbel* as in *P. ramosissimum*; bracts 0, or 1–4, $\frac{1}{6}$–$\frac{1}{4}$ in., linear, sometimes narrowly oblong, sub-serrate. *Calyx-teeth* small, lanceolate. *Styles* long. Dorsal and intermediate ridges scarcely excurrent, lateral with a prominent wing as thick as the seed; dorsal furrows 1-vittate, lateral 2–1-vittate; vittæ large usually as long as the carpel, commissural prominent.

6. **P. ceylanicum,** *Gardn. MS.*; pedicels in fruit $\frac{1}{2}$–1 in., fruit $\frac{1}{4}$ by $\frac{1}{6}$ in., commissure 6–4-vittate. Palimbia ramosissima, *Thwaites Enum.* 131, *not of DC.*

CEYLON; *Gardner*; Galagama, *Thwaites.*
Resembling *P. anamallayense*, and perhaps a variety of it, but the (unripe) fruits are elliptic and less winged, the pedicels very much longer, and the calyx-teeth much smaller. *Styles* long.

7. **P. glaucum,** *DC. Prodr.* iv. 179; segments of the middle cauline leaves narrow-lanceolate serrate of the upper linear entire, fruit $\frac{1}{3}$ by $\frac{1}{4}$ in. truncate commissure 2-vittate. Selinum glaucum, *Wall. Cat.* 580.

NIPAL; *Wallich.*
Glabrous 2–4 ft. Segments of the cauline *leaves* 2 by $\frac{1}{6}$ in., entire in most of Wallich's examples, serrate in the only fruiting one. *Bracts* 0; rays 12–16, $\frac{1}{2}$–1$\frac{1}{4}$ in.; bracteoles 0, or minute; pedicels 8–16, $\frac{1}{6}$–$\frac{1}{3}$ in. *Calyx-teeth* obsolete. *Styles* subprominent. *Fruit* subquadrate, somewhat emarginate at both ends; dorsal and intermediate ridges obscure, lateral subprominently winged, the wing as thick as the seed; vittæ solitary, nearly as long as the carpel.

VAR. ? *nagpurensis*; bracteoles 4–7 $\frac{1}{2}$ in. linear, fruit narrowed at the base, margin thicker than the seed, commissure evittate.—Chota Nagpore, alt. 1500–2000 ft.; Ramghur and Bagoda, *C. B. Clarke*; Behar, at Monghyr, *G. Lockwood.*—Lower leaves twice 3-partite, leaflets 3 by 1$\frac{1}{2}$ in., strongly serrate: upper with linear segments. *Fruit* truncate emarginate at the narrowed base.—This may be a distinct species.

**** *Ultimate segments of the leaves* 1–2 *in., serrate*; *bracts prominent.*

8. **P. grande,** *C. B. Clarke*; leaves 2-pinnate leaflets with 3 large rounded lobes, fruit $\frac{1}{3}$ in. obovate obtuse. Pastinaca grandis, *Dalz. & Gibs. Bomb. Fl.* 107.

BOMBAY GHAUTS; *Dalzell.*
Glabrous, 3 ft. *Leaves* mostly radical, long-petioled, ovate, shining on both surfaces, leaflets 1–3 in. *Bracts* oblong or obovate, obtuse; rays 20, 2–3 in., stout;

bracteoles oblong, obtuse; pedicels 10–16, $\frac{1}{2}$–$\frac{2}{3}$ in. *Petals* yellow. *Ovary* glabrous. *Fruit* narrowed to the base and not there emarginate, nearly as broad as long: dorsal and intermediate ridges triangular, small, obtuse, lateral narrowly winged; dorsal furrows 1-vittate, lateral 2–1-vittate; vittæ nearly as long as the fruit or the lateral abbreviated, commissural 4 abbreviated. *Seed* much broader than thick.—Perhaps a *Heracleum*, but the ovary is glabrous.

***** *Leaves 3–4-pinnate, ultimate segments $\frac{1}{8}$ in. ovate or lanceolate.*

9. **P. Thomsoni,** *C. B. Clarke*; quaternary pinnæ $\frac{1}{3}$ in. ovate deeply pinnatifid, bracts hardly any, styles long.—Peucedanum sp. 5, *Herb. Ind. Or. H. f. & T.*

KASHMIR; alt. 5000–9000 ft.; KISHTWAR and BANAHAL, *Thomson*.

Glabrous, or the leaves sometimes minutely hispidulous, 3–4 ft., stem subnude upwards. Lower *leaves* 6–8 in., broadly ovate, ultimate segments scarcely $\frac{1}{8}$ in. linear-oblong, subobtuse. *Umbels* large, irregular, and often twice or thrice divided; rays unequal; bracteoles hardly any; pedicels 8–12, $\frac{1}{4}$ in. *Calyx-teeth* 0. *Ovary* glabrous. *Fruit* only half-ripe; will be at least $\frac{1}{4}$ in.—The very compound leaves and irregular umbels easily distinguish this species. The genus is doubtful in the absence of ripe fruit, but Dr. Thomson marked it *Peucedanum,* and it has all the appearance of being so.

DOUBTFUL SPECIES.

P.? SKARDICUM, *C. B. Clarke*; glabrous, leaves twice 3-partite secondary pinnæ ovate or elliptic denticulate, bracts 0, bracteoles 4–7 $\frac{1}{8}$ in. lanceolate-linear scarious, petals yellow.—Baltisthan, near Skardo, alt. 12,000 ft., *C. B. Clarke.—Stem* 3–4 ft., corymbose. *Pinnæ* $\frac{1}{2}$–1 in. diam., shining, yellowish green; nerves prominent, flabellate and pinnate, hardly reticulate. *Peduncles* 5–8 in.; rays 10–12, 1$\frac{1}{2}$–2 in., subequal; pedicels 12–20, $\frac{1}{4}$ in. *Calyx-teeth* 0. *Petals* obovate, emarginate. *Disc* large; styles short. *Fruit* very immature, but about to be winged.

33. HERACLEUM, *Linn.*

Herbs, biennial or perennial, never quite glabrous. *Leaves* 1–2–3-pinnate, segments never minute nor filiform. *Umbels* compound; rays usually many; bracts few simple, or 0, rarely many foliaceous; bracteoles many, rarely divided. *Flowers* polygamous, often radiant, white or yellowish. *Calyx-teeth* obsolete, rarely small linear-lanceolate. *Petals* obovate, emarginate or 2-fid. *Ovary* hairy or pubescent. *Fruit* orbicular obovate or elliptic, much dorsally compressed; dorsal and intermediate ridges small or 0, lateral usually winged or rarely acute; vittæ usually solitary in each valley, as long as the carpel or abbreviated and dilated below; carpophore 2-partite. *Seed* much dorsally compressed, plano-convex.—DISTRIB. Species 50; in Temperate Europe and Asia; 1 in N. America, 1 in Abyssinia.

* Species of Northern and North-Eastern India.

† *Not large, drying green, pubescence grey or whitish; fruit when ripe greenish or whitish.* (Approaching *Pastinaca* in habit.)

1. **H. Thomsoni,** *C. B. Clarke*; lower leaves 2-pinnate, bracts small, fruit elliptic $\frac{1}{6}$–$\frac{1}{4}$ by $\frac{1}{8}$–$\frac{1}{6}$ in. winged minutely pubescent.—Pastinaca sp. i., *Herb. Ind. Or. H. f. & T.*

LADAK and PITI; alt. 11,000–15,000 ft., *T. Thomson.* LAHUL; alt. 10,000 ft., *Jaeschke.* KASHMIR; Tilail, alt. 9000 ft., *C. B. Clarke.*

Stems 12–20 in., grey puberulo-pubescent, naked upwards. *Leaves* 6–10 in., ovate-lanceolate, ultimate segments $\frac{1}{2}$–1 in. pinnatifid. *Bracts* 4–5, $\frac{1}{8}$–$\frac{1}{4}$ in.; rays 4–10, 1–2 in; bracteoles 5–8, $\frac{1}{6}$ in., ovate-lanceolate, white-margined. *Ovary* hairy. *Petals* white. *Fruit* distinctly but not broadly winged, greenish-pubescent when ripe, dorsal ridges hardly excurrent; dorsal vittæ extending nearly to the base; commissural 2, near the medial line, half as long.—H. tragoides, *Benth. in Gen. Pl.* i. 924 (Zozimia tragoides, *Boiss.*), is very near this, but in it the lower leaves are pinnate and lobed.

VAR. *glabrior*; leaves nearly glabrous more acutely serrate. Pastinaca sp. 2. *Herb. Ind. Or. H. f. & T.*—North-west Himalaya and Kashmir; alt. 9000–12,000 ft., *Jacquemont, Thomson.*

2. **H. pinnatum,** *C. B. Clarke*; leaves pinnate pinnæ ovate toothed or pinnatifid, bracts small or 0, fruit $\frac{1}{4}$–$\frac{1}{3}$ in. obovate winged.—Heracleum sp. 14, *Herb. Ind. Or. H. f. & T.*

KASHMIR northwards to the KARAKORUM, alt. 10,000–16,000 ft.; *Thomson, C. B. Clarke.*

White-pubescent, 1–3 ft., sparingly corymbose, little leafy upwards. *Leaves* 6–10 in., oblong; pinnæ usually $\frac{1}{2}$–1 in. sometimes 2–3 in., sessile, serrate. *Bracts* 0–4, $\frac{1}{8}$–$\frac{1}{3}$ in., linear or oblong; rays 8–20, 1–3 in.; bracteoles 5–8, $\frac{1}{8}$–$\frac{1}{4}$ in., linear or oblong; pedicels 10–30, $\frac{1}{3}$ in. *Petals* white. *Ovary* hairy. *Fruit* rather broadly winged, minutely pubescent, whitish; dorsal and intermediate ridges excurrent; vittæ broad extending $\frac{2}{3}$ the length of the carpel, a minute vitta added in the centre of the wing; commissural 2, near the medial line, often more than half as long as the mericarp.

3. **H. Jacquemontii,** *C. B. Clarke*; leaves pinnate or 3-partite, segments ovate, bracts 0, fruit orbicular $\frac{1}{8}$ in. winged.

NORTH-WEST HIMALAYA?, *Jacquemont.*

Villous with lax white hairs, 1 ft., nude upwards. *Leaves* ovate, segments $\frac{1}{2}$–$\frac{3}{4}$ in., serrate. *Rays* 7, 1–2 in.; bracteoles 4–8, $\frac{1}{6}$–$\frac{1}{4}$ in., linear; pedicels 10–12, $\frac{1}{3}$ in. *Fruit* minutely pubescent, dorsal and intermediate ridges not excurrent, lateral excurrent in a continuous circular narrow wing; vittæ nearly as long as the carpel, commissural 4.—Very distinct by the small fruits.

4. **H. cachemiricum,** *C. B. Clarke*; lower leaves 2-pinnate pinnæ narrowly oblong entire or remotely obtusely toothed, bracts small, fruit $\frac{1}{4}$ by $\frac{1}{5}$ in. elliptic winged.—Peucedanum glaucum, *Herb. Ind. Or. H. f. & T., not of Wall.*

MURREE, *Falconer*; JAMU, alt. 5000–6000 ft., *Thomson*; KASHMIR; Nowgunge, alt. 8000 ft., *C. B. Clarke.*

Minutely pubescent, 2–3 ft., naked, sparingly corymbose upwards. *Leaves* 6–12 in., ovate, secondary pinnæ 1–3 by $\frac{1}{12}$–$\frac{1}{3}$ in., sessile, subobtuse. *Bracts* 2–4, $\frac{1}{8}$–$\frac{1}{4}$ in., lanceolate; rays 6–10, 1–2 in.; bracteoles 5–8, $\frac{1}{6}$ in., lanceolate; pedicels 8–20, $\frac{1}{6}$–$\frac{1}{3}$ in. *Fruit* pubescent; dorsal and intermediate ridges hardly excurrent, lateral forming a continuous narrow wing; vittæ broad nearly as long as the carpel, commissural 2, near the medial line.

†† *Large, drying brown; fruit when ripe brown, often with a very thin wing.*

5. **H. Wallichii,** *DC. Prodr.* iv. 195; glabrescent upwards, upper leaves 3-partite or pinnate, bracts 1–2 small deciduous or 0, calyx-teeth linear prominent, fruit $\frac{3}{8}$ by $\frac{1}{4}$ in. obovate, commissure evittate. H. diversifolium, *Wall. Cat.* 574.

NIPAL; *Wallich.* SIKKIM: on Singaleleh, alt. 10,000 ft., *C. B. Clarke.*

Stem 3–4 ft., white-hirsute beneath the nodes. *Leaves* serrate, pilose above and

on the nerves beneath. *Bracts* 1, $\frac{1}{4}$ in., linear; rays 6–8, 1–2$\frac{1}{2}$ in., glabrous; bracteoles 0–5, $\frac{3}{4}$ in., linear; pedicels 8–16, $\frac{1}{2}$–$\frac{3}{4}$ in. *Fruit* glabrous, brown, dorsal and intermediate ridges not prominent, wing broad having a narrow median vitta; vittæ about half as long as the fruit subclavate below.

VAR. *elatior*; more hairy upwards, bracts 4–6, rays 20–30 hairy.—Nipal.—This may be a different species but contains only very immature fruit. The upper leaves are lobed, not divided, more hairy than in the type, and the bracteoles are much more prominent. Bentham (*Gen. Pl.* i. 922) referred *H. diversifolium* to *Peucedanum*: but is not now certain to which of the many plants mixed under the name *H. diversifolium* he referred. *H. Wallichii* is a typical *Heracleum*, with the vittæ hardly half as long as the mericarp.

6. **H. nubigenum,** *C. B. Clarke*; upper leaves 3-partite or pinnate glabrescent, bracts several deciduous, calyx obsolete, fruit $\frac{1}{4}$ in. orbicular emarginate at both ends, commissure subevittate.

SIKKIM, alt. 10,000–14,000 ft.; Chola Pass, *J. D. H.*; Yakla Pass, *C. B. Clarke.*

Stem 3–5 ft., pubescent. Tertiary pinnæ 1–3 in., ovate, serrate, often lobed, slightly pubescent. *Bracts* 4–12, $\frac{1}{2}$ in., linear; rays 30–50, 2–6 in., pubescent; bracteoles 4–10, $\frac{1}{4}$ in., linear; pedicels 15–30, $\frac{1}{4}$–$\frac{3}{4}$ in. *Fruit* glabrous, brown; dorsal and intermediate ridges obtuse, little excurrent, much broader than the vittæ; wing broad interrupted at the apex and base; vittæ nearly as long as the fruit, commissural usually 0, or 1–2 very short near the apex, sometimes fragments of an interrupted vitta are seen.—The fruit of this plant is much like that of *Cortia Hookeri.*

7. **H. Brunonis,** *Benth. in Gen. Pl.* i. 921; upper leaves pinnate oblong, bracts 5–8 $\frac{1}{2}$–1 in. lanceolate hirsute sometimes divided or foliaceous, fruit $\frac{1}{4}$–$\frac{1}{3}$ by $\frac{1}{6}$–$\frac{1}{4}$ in. elliptic. Tordylium ? Brunonis, *Wall. Cat.* 590. Tordyliopsis Brunonis, *DC. Prodr.* iv. 199.

From KUMAON; *Wallich*; to SIKKIM; alt. 10,000–13,500 ft.

Stem 1–3 ft., pubescent. Cauline *leaves* 6–8 by 2–3 in.; pinnæ subsessile, ovate, lobed or pinnatifid, serrate, sparingly pubescent. *Rays* 4–8, 1–1$\frac{1}{4}$ in.; bracteoles 5–6, $\frac{1}{3}$ in., lanceolate; pedicels 8–16, much shorter than the bracteoles. *Flowers* greenish-white or purple (*J. D. H.*), outer often radiant, large. *Calyx-teeth* minute. *Styles* long. *Fruit* glabrous, brown; dorsal and intermediate ridges filiform, hardly excurrent; wing prominent with a minute marginal vitta; vittæ $\frac{2}{3}$ or $\frac{3}{4}$ the length of the fruit, commissural 0, or 2 and short.

8. **H. sublineare,** *C. B. Clarke*; pinnæ of the upper leaves linear or nearly linear, bracts small or 0, calyx-teeth linear, fruit $\frac{1}{5}$–$\frac{1}{4}$ by $\frac{1}{6}$–$\frac{1}{5}$ in. elliptic, commissure 2-vittate.—Pastinaca sp. 4, *Herb. Ind. Or. H. f. & T.*

SIKKIM, alt. 10,000–13,000 ft., *J. D. H.*, &c.

Stem 2–4 ft., pubescent. Lower *leaves* 6 in., ovate, 2-pinnate; pinnæ lanceolate, serrate, little pubescent, upper pinnate, pinnæ often 4 by $\frac{1}{4}$ in., or 2 by $\frac{1}{8}$ in. *Bracts* 1–3, $\frac{1}{4}$ in., linear, often 0; rays 4–8, 1–1$\frac{1}{2}$ in., hairy: bracteoles 2–5, $\frac{1}{6}$–$\frac{1}{4}$ in., linear; pedicels 6–16, $\frac{1}{4}$ in. *Flowers* white, outer often radiant, large. *Fruit* glabrous, brown, dorsal and intermediate ridges filiform hardly excurrent; wing broad, continuous, with a minute marginal vitta; dorsal vittæ more than half as long as the fruit, commissural 2, usually slender, close to the medial line, nearly as long as the mericarp, rarely shorter or interrupted.

9. **H. canescens,** *Lindl. in Royle Ill.* 232; stem and leaves softly hairy, upper leaves mostly pinnate, bracts small or 0, fruit $\frac{1}{3}$ by $\frac{1}{4}$ in. obovate, commissure 2-vittate. H. hirsutum, *Edgw. in Trans. Linn. Soc.* xx. 57. ? H. cinereum, *Lindl. in Royle Ill.* 232.

NORTH-WEST HIMALAYA, alt. 6000–8000 ft.; Kishtwar and Banahal, *Royle, Thomson*; Simla, *Lady Dalhousie*, &c.

Stem 1–4 ft., subnude upwards, hirsute with white lax hairs at the apex of the peduncles. *Leaves* 3–12 in., 1–2-pinnate, oblong or ovate; pinnæ ¼–3 in., ovate or oblong, acute or obtuse, crenate-serrate or lobed, rhachis with lax white hair. *Bracts* 1–4, ¼ in., linear or lanceolate, or 0; rays 6–16, 1–3 in.; bracteoles 4–8, ¼ in., linear or linear-lanceolate; pedicels 8–16, 0–⅜ in. *Calyx-teeth* linear, small. Young *ovary* very hairy, rarely slightly pubescent. Dorsal and intermediate *ridges* filiform, distinctly elevated; wing broad; dorsal vittæ ⅔ the length of the fruit, not clavate below, commissural distinct, near the medial line, more than half as long as the carpel.—Easily separated from *H. candicans* by the indumentum. The leaves are most variable. No example exists at Kew of *H. cinereum*, but there appears no reason why it should not belong here.

10. **H. candicans,** *Wall. Cat.* 573; leaves pinnatifid or pinnate, pinnæ obtusely lobed or pinnatifid tomentose or white-villous beneath, bracts small or 0, fruit ½ by ¼–⅓ in. obovate, commissure 2-vittate. *DC. Prodr.* iv. 192.

From KASHMIR to KUMAON, alt. 6000–12,000 ft., common.

Stem 2–6 ft., pubescent or closely villous. *Pinnæ* often 8 by 6 in., crenate-serrate, thickly white-tomentose, or only slightly grey-pubescent. *Bracts* 1–3, ¼–½ in., linear, or 0; rays 10–40, 1–4 in.; bracteoles 4–8, ¼ in., linear; pedicels 8–16, ⅛–¼ in. *Calyx-teeth* linear. Dorsal and intermediate *ridges* filiform slightly excurrent, wing broad with a small distinct median vitta; vittæ in Wallich's example ½ the length of the fruit, in others (with less elongate-obovate fruits) ⅔ the length; commissural in the type more than ½ the length, or minute near the apex, or 0.

11. **H. obtusifolium.** *Wall. Cat.* 577; upper leaves 3-fid or 3-partite lower 3–5-partite, pinnæ round crenate white-tomentose beneath, bracts 2–5 ½–1 in. deciduous. *DC. Prodr.* iv. 192.

NIPAL; *Wallich*. SIKKIM; Lachen, alt. 12,000 ft., *J. D. H.* BHOTAN, *Griffith*.

Stem 1–3 ft., pubescent or villous. *Pinnæ* 1–4 in. diam., sometimes 2–3-lobed, always rounded, scarcely serrate. *Rays* 10–16, 1–3½ in.; bracteoles 4–8, ¼–⅓ in.; pedicels 10–20 ¼–⅓ in. *Calyx-teeth* linear, small. Outer *flowers* of the umbel moderately or not at all radiant. *Fruit* (ex DC.) obovate, commissure 4-vittate, dorsal vittæ linear, extending ¾ its length in the unripe fruit.

12. **H. nepalense,** *Don Prodr.* 185; upper leaves acutely 3-lobed rarely divided sparingly pubescent, lower pinnate, bracts 0 or inconspicuous, fruit ⅓ by ¼ in. obovate, commissure 4-vittate. *Wall. Cat.* 576; *DC. Prodr.* iv. 192.

From NIPAL to BHOTAN, alt. 5000–12,000 ft.; frequent.

Stem 2–5 ft., sparingly pubescent. *Pinnæ* often 6 by 4 in., deeply lobed or pinnatifid, serrate. *Bracts* 3–5, ⅙ in., linear, sometimes 0; rays 8–20, 1½–3 in.; bracteoles 0–6, ⅙ in., linear; pedicels 8–20, ¼–½ in. *Calyx-teeth* linear, small. Outer *flowers* of the umbel radiant or not. Dorsal and intermediate *ridges* hardly excurrent; wing broad, with a prominent small marginal vitta; dorsal vittæ ⅔ the length of the fruit, commissural 4, ⅔ the length in Wallich's examples, shorter in others.

VAR. *bivittata*; fruit ¼ in. elliptic or subobovate, commissure 2-vittate.—Sikkim and Bhotan, common.—Uppermost leaves sometimes 3-partite, and middle cauline leaves sub-2-pinnate. A very doubtful plant, some specimens of which have been referred to a variety of *H. diversifolium* with 2-vittate commissure, but the cutting of the leaves is that of *H. nepalense*.

13. **H. burmanicum,** *Kurz in Journ. As. Soc.* 1872, pt. ii. 309, and 1877, pt. ii. 116; lower leaves 1–2-pinnate hairy, bracts 5–8 ¾ in. lanceolate,

fruit $\frac{1}{3}$ by $\frac{1}{4}$ in. obovate, furrows between the lateral and intermediate ridges 2-vittate, commissure 2-vittate.—Heracleum sp. 5, *Herb. Ind. Or. H. f. & T.*

KHASIA MTS., alt. 4000–6000 ft., common. PEGU, alt. 2500–3000 ft., frequent, *Kurz.*

Stem 2–4 ft., villous. Upper *leaves* 3-fid or 3-partite, pinnæ 1–3 in., cordate or ovate-lanceolate, serrate. *Rays* 6–12, $1\frac{1}{2}$ in.; bracteoles 5–10, $\frac{1}{4}$–$\frac{1}{3}$ in. *Calyx-teeth* linear, small. *Petals* white, of the outer flowers radiant or not. Dorsal and intermediate *ridges* elevated hardly excurrent, vittæ between them 1 rarely 2; wing broad with a narrow marginal vitta; vittæ in the furrows between the intermediate and lateral ridges usually 1–3, more than half the length of the mericarp, commissural 2, usually more than half as long, 2 fragmentary often added.

** Species of Southern India and Ceylon.

14. **H. Hookerianum,** *W. & A. Prodr.* 373; lower leaves undivided roundly 3-lobed villous often woolly beneath, upper much reduced often to mere sheaths, bracts not prominent, fruit $\frac{1}{4}$–$\frac{1}{3}$ in. broadly elliptic scarcely obovate obtuse at both ends. Pastinaca Hookeriana, *Wight Ic.* t. 1010.

NILGHIRI MTS.; *Wight, Gardner, G. Thomson.*

Stem 12–18 in. villous or pubescent, subnude upwards. *Leaves* 2-4 in. diam., sometimes peltate, often 3-lobed, lobes 2–3-fid, lobes rounded, crenate, not serrate. *Bracts* 1–5, $\frac{1}{4}$–$\frac{1}{3}$ in., lanceolate or 0; rays 4–10, 1–3 in., hairy, unequal, sometimes compound; bracteoles 0–8, 0–$\frac{1}{4}$ in., lanceolate or linear, very variable; pedicels 4–10, $\frac{1}{4}$ in. *Calyx-teeth* small, lanceolate. Outer *flowers* of the umbel radiant or not. *Fruit* obtuse, dorsal and intermediate ridges slender, hardly elevated; wing broad, with a narrow marginal vitta; vittæ solitary in the furrows, large, nearly as long as the carpel, commissural 4–2, the 2 longer extending nearly to its base.—Distinguished from *H. rigens,* of which it may be a form, by the undivided leaves: it appears uniformly smaller, more naked upwards, the fruits shining scarcely narrowed at the base.

15. **H. rigens,** *Wall. Cat.* 575; lower leaves pinnate, pinnæ 3–5 rarely 7 orbicular villous beneath upper much reduced, bracts not prominent, fruit $\frac{1}{3}$ by $\frac{1}{4}$ in. obovate-elliptic. *DC. Prodr.* iv. 191; *W. & A. Prodr.* 373. ? H. sprengelianum, *Dalz. & Gibs. Bomb. Fl.* 108. Pastinaca rigens, *Wight Ic.* t. 1009.

MTS. of the DECCAN PENINSULA; *Heyne*; *Rottler*; Nilghiris and near Courtallum, *Wight.* CEYLON, *Walker, Thwaites* (No. 145 *partly*).

Near *H. Hookerianum,* but usually larger (2–3 ft.) with larger umbels. Lower *leaves* 3–12 in.; pinnæ 1–3 in. diam., obtuse, crenate not serrate. *Fruit* nearly as in *H. Hookerianum* but dull reddish-brown, often more elongate at the base, in which case the vittæ extend only $\frac{2}{3}$ the length of the carpel; commissural vittæ 2–6, usually 4.

VAR. *Candolleana*; lower leaves 2-pinnate, pinnæ lobed crenate or crenate-serrate. Pastinaca Candolleana, *W. & A. Prodr.* 372. P. ligusticifolia, *Wight Ill.* t. 116; *W. & A. Prodr.* 372.—Mts. of the Deccan Peninsula; plentiful.

16. **H. aquilegifolium,** *C. B. Clarke*; glabrous, lower leaves 3-partite or pinnate, pinnæ large ovate 3-lobed, fruit $\frac{1}{4}$–$\frac{1}{3}$ in. orbicular or subelliptic, vittæ in the lateral furrows usually 2–3. Heracleum sp. 11, *Herb. Ind. Or. H. f. & T.*

CONCAN; tropical region, *Law, Stocks.*

Stem 2–3 ft. Pinnæ of the lower *leaves* 2–4 in. diam., denticulate: upper leaves often undivided, uppermost reduced to sheaths. *Umbels* often in a nearly naked raceme. *Bracts* 3–5, $\frac{1}{4}$–$\frac{1}{2}$ in., lanceolate; rays 6–10, $1\frac{1}{2}$–$2\frac{1}{2}$ in.; bracteoles

3–5, $\frac{1}{4}$ in., lanceolate or linear, sometimes obtuse. Dorsal *ridges* distinct, shortly excurrent, wing broad with a minute marginal vitta; dorsal vittæ produced nearly to the base; commissural 6–8.—Very near *H. rigens var. ligusticifolium* which has the leaves sometimes nearly glabrous, but the leaves are less serrate, and the vittæ are usually 2–3 in the lateral furrows.

17. **H. ceylanicum,** *Gardn. ms.*; lower leaves pinnate pinnæ deeply pinnatifid, lobes oblong hairy above villous beneath, fruit as in *H. rigens.* H. Sprengelianum, *Thwaites Enum.* 131, *not of W. & A.*

CEYLON; *Walker, Gardner, Wight, Thwaites* (No. 145 *partly*).

Pinnæ of the lower leaves 1–2 by $\frac{1}{4}$–$\frac{1}{3}$ in., sharply closely serrate or crenate. Outer *flowers* of the umbel somewhat radiant, with lanceolate acute calyx-teeth. *Fruit* $\frac{1}{3}$–$\frac{1}{2}$ by $\frac{1}{4}$ in., obovate, totally unlike that of *H. Sprengelianum* W. & A., but altogether that of *H. rigens* from which this differs only in the cutting of the leaves, which is uniform in the numerous examples.

18. **H. Sprengelianum,** *W. & A. Prodr.* 372; lower leaves 1–2 pinnate hairy, pinnæ large ovate pinnatifid or lobed, fruit $\frac{1}{5}$–$\frac{1}{4}$ by $\frac{1}{6}$–$\frac{1}{5}$ in. elliptic narrowly winged. Pastinaca Sprengeliana, *Wight Ic.* t. 1008.

NILGHIRI MTS., *Wight, Gardner.*

Stem 2–4 ft. Lower *leaves* 8–16 in., ovate; secondary pinnæ often 4 by 3 in., lobed, crenate-serrate. *Bracts* usually 0; rays 6–16, 1–2$\frac{1}{2}$ in., nearly glabrous; bracteoles 3–5, $\frac{1}{4}$ in., lanceolate, caducous; pedicels 8–16, in fruit $\frac{1}{2}$ in. *Calyx-teeth* obscure, in the radiant flowers small, ovate, obtuse. Dorsal and intermediate *ridges* obsolete; wing less than $\frac{1}{40}$ in. wide; vittæ often $\frac{3}{4}$ the length of the carpel, or more; commissural 2–4.—Easily distinguished from the foregoing species by the small fruit.

19. **H. concanense,** *Dalz. in Hook. Kew Journ.* ii.; 260; lower leaves 2–3-pinnate pubescent, fruit $\frac{1}{5}$–$\frac{1}{4}$ by $\frac{1}{6}$–$\frac{1}{5}$ in. elliptic not winged, primary ridges obtuse equally prominent. *Dalz. & Gibs. Bomb. Fl.* 107. H. grandiflorum, *Dalz. & Gibs. l. c.* 108.

CONCAN HILLS; *Dalzell, &c.*

Stem 2–4 ft., more or less hispid. Tertiary *pinnæ* of the lower leaves often 1–2 in., ovate, deeply 3-lobed, serrate; upper leaves much reduced, uppermost often to sheaths. *Bracts* 3–5, $\frac{1}{8}$–$\frac{1}{6}$ in., oblong, obtuse, or 0; rays 5–10, 1–2 in.; bracteoles very variable, 5–7, lanceolate and longer than the umbellule, or small, linear. *Calyx-teeth* obscure, or small, oblong. Outer *flowers* usually radiant, large. *Fruit* exceedingly hard, much less dorsally compressed than in other species, ridges prominent; vittæ as long as the carpel, those of the lateral furrows usually 2, commissural 2–4.

VAR. ? *Stocksii*; dorsal and intermediate ridges (in the unripe fruit) slender lateral ridges excurrent into a narrow very thin ring. Heracleum sp. 10, Herb. Ind. Or. H. f. & T.—Concan; *Stocks. Fruit* the same size as in *H. concanense* type, and vittæ the same. This may be a new species; for the wing of the unripe fruit will almost certainly dilate and will then be unlike that of *H. concanense.*

20. **H. pedatum,** *Wight. Ic.* t. 342; cauline leaves pedately 5–7-foliolate, leaflets lanceolate serrate hairy sometimes again lobed deeply.

DECCAN; Shevagherry Hills, *Wight.* BELGAUM; *Law.*

Stem 12 in., or more, remotely hirsute. *Petioles* 2–6 in.; leaflets 1–2 by $\frac{1}{4}$–$\frac{3}{4}$ in. *Bracts* usually 1, $\frac{1}{3}$ in., linear-lanceolate; rays 5–6, 1–1$\frac{1}{2}$ in.; bracteoles 0–5, $\frac{1}{8}$–$\frac{1}{6}$ in., lanceolate; pedicels 8–12, $\frac{1}{6}$ in., in young fruit. Outer flowers of the *umbel* radiant; calyx-teeth linear, prominent; style-bases large conical. *Fruit* very immature in our specimen and in Wight's drawing.—The large style-bases and pedate leaves are not like *Heracleum*; the fruit promises to be like that of *Schultzia.*

21. **H. Pinda,** *Dalz. & Gibs. Bomb. Fl.* 107; clothed with long weak white flat hairs, lower leaves bipinnate, pinnæ cuneate coarsely toothed, vittæ 2 in the lateral furrows, commissure 2-vittate.

BOMBAY; On Hursur and Hurry-chunder hill forts, *Dalzell.*

Stem 1–1½ ft., erect, branched. *Leaves* mostly radical, long-petioled. *Bracts* 1–3, broad-ovate, acute, foliaceous; rays 6–8, unequal; bracteoles 3, like the bracts. *Flowers* white, exterior radiant.—Not seen: the foregoing copied from Dalzell, *l. c.*

34. ZOSIMIA, *Hoffm.*

A perennial *herb*, pubescent or hirsute. *Leaves* 2–4-pinnate, segments small. *Umbels* compound, rays numerous; bracts and bracteoles usually many, small. *Calyx-teeth* linear, somewhat prominent. *Petals* obovate, emarginate, white or yellowish, often unequal sometimes radiant. *Fruit* elliptic or orbicular, dorsally compressed, complanate; dorsal and intermediate ridges filiform or obscure, lateral hyaline, with a thick corky obtuse wing; furrows with solitary large vittæ; carpophore 2-partite. *Seed* 4–6 times broader than thick.

1. **Z. absinthifolia,** *DC. Prodr.* iv. 195; *Boiss. Fl. Orient.* ii. 1037. Z. orientalis, *Hoffm. Gen. Umb.* 148, t. 4. Z. radians, *Boiss. & Hohen. in Boiss. l. c.* 1037. Heracleum absinthifolium, *Vent. Choix* t. 7. H. tomentosum, *Smith, not of Dalz.*

SCINDE; *Stocks.* PUNJAB; base of Suleiman Mts., *Edgeworth.*—DISTRIB. Beloochistan and Cabul to S.E. Europe.

Stem 1–3 ft., pubescent or hirsute. *Leaves* 4–8 in., oblong-lanceolate, pubescent, ultimate segments ¼–½ in. narrowly lanceolate or linear. *Bracts* and bracteoles variable, usually 5, ⅛–⅙ in., lanceolate; rays 6–16, 1–3 in., often stout; pedicels 8–20, ⅛–⅓ in. *Fruit* ⅓ by ¼ in., elliptic or somewhat obovate, variable in size and shape, pubescent till fully ripe.

34.* CORIANDRUM, *Linn.*

A *herb*, annual, branched, glabrous. *Leaves* decompound. *Umbels* compound, rays few; bracts 0, or small linear; bracteoles few, filiform. *Calyx-teeth* small, acute, often unequal. *Petals* obovate, emarginate, white or purplish, of the outer flowers unequal, often radiant. *Fruit* subglobose; ridges not prominent, dorsal primary and adjacent secondary strongest, lateral primary and secondary obscure; vittæ obscure, solitary, under the secondary ridges; carpels slightly concave on the inner face, commissure distinctly 2-vittate; carpophore 2-partite. *Seed* convexo-concave, about thrice as broad as thick.

1. **C. sativum,** *Linn.*; *DC. Prodr.* iv. 250; ultimate segments of the lower leaves ovate or lanceolate of the upper linear. *Roxb. Hort. Beng.* 21, *Fl. Ind.* ii. 94; *Wight Ill.* t. 117, *fig.* 9, *Ic.* t. 516; *Boiss. Fl. Orient.* ii. 920. Cuminum Cyminum, *Wall. Cat.* 594.

Throughout INDIA; cultivated.—DISTRIB. Widely cultivated.

34.** CUMINUM, *Linn.*

A slender, annual *herb*, glabrous except the fruit. *Leaves* twice or thrice 3-partite, ultimate segments filiform. *Umbels* compound, rays few; bracts and bracteoles several, linear, rigid. *Calyx-teeth* small, subulate, unequal.

Petals oblong or obovate, emarginate, white, often unequal. *Fruit* cylindric, tip narrowed; primary ridges filiform, distinct; secondary usually hispidulous; vittæ large, solitary under each secondary ridge; carpophore 2-partite or 2-fid. *Seed* somewhat dorsally compressed, convexo-concave.

1. **C. Cyminum,** *Linn.*; *DC. Prodr.* iv. 201; *Roxb. Hort. Beng.* 21, *Fl. Ind.* ii. 92; *Wall. Cat.* 7213; *Wight Ill.* t. 117, *fig.* 6; *W. & A. Prodr.* 372; *Boiss. Fl. Orient.* ii. 1080.

PUNJAB PLAIN, DECCAN, &c., cultivated.—DISTRIB. Widely cultivated.

35. **DAUCUS,** *Linn.*

Annual or biennial herbs, usually hispid. *Leaves* 2–4-pinnate, ultimate segments narrow or small. *Umbels* compound, rays usually many; bracts generally very many, pinnate; bracteoles many, 3-fid entire or 0. *Calyx-teeth* small, or obsolete. *Petals* obovate, emarginate, white, outer often radiant. *Fruit* elliptic, terete or somewhat dorsally compressed; ridges all prominent, all or secondary only bristly, lateral primary little developed, lateral secondary usually the widest almost in the plane of the commissure; vittæ solitary, under the secondary ridges; carpophore undivided or 2-fid. *Seed* ½-terete, dorsally subcompressed, inner face plane.—DISTRIB. Species 20, mostly Mediterranean and temperate Asiatic; 2 N. American, 1 Australian.

1. **D. Carota,** *Linn.*; *DC. Prodr.* iv. 211; hispid, leaves 2–3-pinnate, pinnæ pinnatifid segments narrow-lanceolate, outer rays connivent in fruit, bristles of the secondary ridges as broad as the fruit, of primary shorter or 0. *Roxb. Hort. Beng.* 21, *Fl. Ind.* ii. 90; *Wall. Cat.* 7214; *W. & A. Prodr.* 374; *Wight Ill.* t. 117, *fig.* 7; *Boiss. Fl. Orient.* ii. 1076.

KASHMIR and the WESTERN HIMALAYA, alt. 5000–9000 ft.; cultivated elsewhere in India.—DISTRIB. Of the genus.

Stem 1–4 (in the Himalaya often 6) ft. *Bracteoles* many, 3-fid and simple. *Fruit* $\frac{1}{10}$ in.; bristles on the secondary ridges glistening white, connate at the base only, of the primary ridges small or sessile, subglochidiate; carpophore undivided.—The *carrot.*

36. **CAUCALIS,** *Linn.*

Annual *herbs*, scabrid or hispid. *Leaves* 2–4-pinnate. *Umbels* compound, rays few (in Indian species); bracts 0, or linear, inconspicuous; bracteoles usually several, linear or oblong, membranous. *Calyx-teeth* small, acute, or obsolete. *Petals* obovate, emarginate, white or purplish, outer often radiant. *Fruit* elliptic or oblong, terete, subcompressed laterally, constricted at the commissure; primary and secondary ridges prominent or not, with 1 or 3 rows of bristles or tubercles; vittæ solitary, under the secondary ridges; carpophore undivided or 2-fid. *Seed* ½-terete, deeply grooved on the inner face.—DISTRIB. Species 18, principally in the temperate Old World.

1. **C. Anthriscus,** *Scop.*; *Don Prodr.* 183; bracts 1–5 $\frac{1}{6}$–$\frac{1}{3}$ in. linear, fruit $\frac{1}{8}$ in., primary and secondary ridges equally bristly not prominent. C. elata, *Wall. Cat.* 564; *Don Prodr.* 183. Tordylium Anthriscus, *Linn.* Torilis Anthriscus, *Gmel.*; *DC. Prodr.* iv. 218; *W. & A. Prodr.* 374; *Boiss. Fl. Orient.* ii. 1081. T. japonica and elata, *DC. Prodr.* iv. 219, 220.

HIMALAYA, alt. 3000–9000 ft.; from KASHMIR to SIKKIM, frequent.—DISTRIB. N. Asia, Europe, N. Africa.

Adpressedly hispid; 1–2 (in the Himalaya 5) ft. Secondary *pinnæ* 1 in., pinnatifid half-way down into lanceolate acute lobes. *Umbels* long-peduncled, rays 5–12; bracteoles linear, not white-margined. *Petals* purplish or white, not radiant. Bristles scattered over the whole surface of the *fruit*, rough, curved or almost hooked, not glochidiate.

2. **C. leptophylla,** *Linn.*; *DC. Prodr.* iv. 216; bracts 0, fruit $\frac{1}{6}$–$\frac{1}{4}$ in., secondary ridges prominent, primary filiform minutely hispid, bristles in 1–3 rows. *Boiss. Fl. Orient.* ii. 1084.

KASHMIR, alt. 4000–6000 ft., *Jacquemont, Thomson*. PUNJAB; *Falconer*.—DISTRIB. W. Asia, S. Europe, N. Africa.

Resembling *C. Anthriscus,* but the leaves rather more finely cut, ultimate segments narrower, sometimes almost linear; fruit larger, bristles longer, shining, scarcely scabrous, subglochidiate. *Umbels* often lateral, peduncle 1–2 in., stout; rays usually 2–5.

3. **C. latifolia,** *Linn. Syst. Nat.* ii. 205; bracts and bracteoles small oblong white-membranous, fruit $\frac{1}{3}$ in., primary and secondary ridges equally prominent and aculeate. Tordylium latifolium, *Linn. Sp. Pl.* 345. Turgenia latifolia, *Hoffm.*; *DC. Prodr.* iv. 218; *Boiss. Fl. Orient.* ii. 1087.

KASHMIR; *Falconer*; alt. 5000–8000 ft., frequent, *C. B. Clarke*.

Hispid, almost prickly, 4–24 in., rigid, erect or divaricate. *Leaves* 1–2-pinnate, pinnæ often 1–2 in., oblong, serrate or pinnatifid half-way to the midrib. *Rays* 3–4, 1–3 in.; pedicels hardly $\frac{1}{4}$ as long as the fruit. *Carpels* with 7 subequally aculeate ridges, the two lateral primary ridges within the commissure less prominent; bristles stout, rough, curved or nearly straight at the apex, hardly glochidiate.

37. **PSAMMOGETON,** *Edgw.*

A small annual, pubescent or glabrous. *Leaves* 1–2-pinnate, pinnæ laciniate. *Umbels* compound; bracts and bracteoles many, small, lanceolate or linear, scarious. *Calyx-teeth* obsolete. *Petals* obovate, emarginate, white or purplish, not or but slightly radiant in the outer flowers. *Fruit* small, ovoid or lanceolate commissure slightly constricted; primary and secondary ridges hairy, elevated, scarcely winged, secondary rather the more prominent; vittæ solitary, under the secondary ridges; carpophore 2-fid. *Seed* somewhat dorsally compressed, inner face plane or scarcely concave.

1. **P. biternatum,** *Edgw. in Trans. Linn. Soc.* xx. 57; segments of the lower leaves ovate pinnatifid into narrow lobes of the upper narrowly cuneate laciniate, hairs on the ridges white capitellate 1-seriate scattered longer than the carpel is broad. P. crinitum, *Boiss. Fl. Orient.* ii. 1078. Pimpinella crinitum, *Boiss. in Ann. Sc. Nat.* 3rd ser. i. 131.

PUNJAB PLAIN, ascending the Himalaya to 3000 ft.; frequent. SCINDE.—DISTRIB. Beloochistan, Cabul, Persia.

Stem 2–8 in., divaricately branched, pubescent or grey subtomentose, not villous. *Peduncles* 1–3 in., stout, lateral and terminal. *Bracts* 3–8, $\frac{1}{4}$–$\frac{1}{2}$ in., narrowly lanceolate or linear; rays 5–10, $\frac{1}{2}$–1 in.; bracteoles 4–8, $\frac{1}{4}$ in., lanceolate, sheathing the young umbellule; pedicels 6–16, $\frac{1}{4}$ in. *Fruit* scarcely $\frac{1}{8}$ in., lanceolate, thinly hairy in the Indian plants; styles very long.

VAR.? *villosa*; much taller with patent soft hairs, ridges of the fruit with several dense rows of often brown hairs.—Scinde, *Stocks*: a frequent form in Beloochistan

and Cabul.—Very unlike the type, but there are intermediate forms. Probably *P. brevisetum and setifolium*, Boiss. *Fl. Orient.* ii. 1079, are other varieties.

DOUBTFUL UMBELLIFERÆ.

SISON TRINERVE, *Ham. in Don Prodr.* 184; *DC. Prodr.* iv. 111.

ATHAMANTHA GIGANTEA, *Don Prodr.* 184; *DC. Prodr.* iv. 156.

ATHAMANTHA TERES, *Don Prodr.* 185; *DC. Prodr.* iv. 156.

LIGUSTICUM ? NEPALENSE, *Don Prodr.* 125; *DC. Prodr.* iv. 159. (An Hymenolæna? *DC. l. c.*)

ORDER LXXI. **ARALIACEÆ.** (By C. B. Clarke.)

Trees or shrubs, very rarely herbs, sometimes scandent or scandent when young and finally self-supporting, not rarely prickly. *Leaves* alternate, the uppermost rarely sub-opposite, long-petioled, large, simple or compound; stipules adnate to the petiole, sometimes inconspicuous or 0. *Flowers* regular, small, sometimes polygamous, in umbels racemes or panicled heads; bracts and bracteoles small or conspicuous; pedicels continuous with the base of the calyx or there jointed. *Calyx-tube* adnate to the ovary; limb truncate, obsolete or with small teeth. *Petals* 5 rarely 6–7 or many, valvate or subimbricate, expanding or deciduous in a cap. *Stamens* as many as and alternate with the petals (very many in *Tupidanthus*), inserted round an epigynous disc. *Ovary* inferior, 2-celled, or cells as many as the stamens (in *Arthrophyllum* 1-celled); styles as many as the cells, distinct or united; ovules solitary and pendulous in each cell. *Fruit* coriaceous or drupaceous usually small, one or more cells sometimes suppressed. *Seed* pendulous, albumen uniform or ruminated; embryo minute, radicle next the hilum.—DISTRIB. Species 340, chiefly tropical and subtropical, a few in the cool temperate zones.

SECT. I. **Araliese.** *Petals* imbricated (but only lightly). *Pedicels* jointed.

Styles 2–5, free. Leaves compound . . . . 1. ARALIA.
Styles 5, combined . . . . 2. PENTAPANAX.
Styles 4–3, free. Leaves pinnatifid . . . . 3. ARALIDIUM.

SECT. II. **Panaceæ.** *Petals* valvate. *Albumen* uniform.

* *Ovary 2-celled.*

Pedicels jointed. Leaves decompound . . . . 3.*PANAX.
Pedicels continuous. Leaves digitate . . . . 4. ACANTHOPANAX.

** *Ovary 4–10-celled.*

† *Umbels sessile on the back of the leaf.*

Leaves simple . . . . 5. HELWINGIA.

†† *Pedicels jointed.*

Leaves once pinnate . . . . 6. POLYSCIAS.

††† *Pedicels continuous. Leaves not pinnate.*

Fruit angular the size of a pea . . . . 7. HEPTAPLEURUM.
Fruit more than ½ in. long . . . . 8. TREVESIA.
Flower sessile embraced by 4 bracteoles . . . . 9. BRASSAIA.
Leaves simple (except the lowermost) . . . . 10. DENDROPANAX.

SECT. III. **Hedereæ.** *Petals* valvate. *Albumen* ruminated.

* *Ovary 1-celled.*

Leaves pinnate or undivided . . . . 11. ARTHROPHYLLUM.

** *Ovary 2-celled.*

Pedicels continuous. Styles distinct . . . . 12. HETEROPANAX.
Pedicels continuous. Styles combined . . . . 13. BRASSAIOPSIS.
Pedicels jointed. Styles combined . . . . 14. MACROPANAX.

*** *Ovary 5–4-celled; styles combined.*

† *Leaves simple lobed or pinnate.*

Pedicels continuous . . . . 15. HEDERA.
Pedicels jointed . . . . 16. HEDEROPSIS.

†† *Leaves digitate.*

Tree. Leaflets ciliate . . . . 17. GAMBLEA.

SECT. IV. **Plerandreæ.** *Petals* valvate. *Stamens* 20–50.

Petals united, falling off in a cap . . . . 18. TUPIDANTHUS.

1. ARALIA, *Linn.*

Herbs shrubs or small trees, glabrous hairy or prickly. *Leaves* alternate or whorled, digitate pinnate or compound-pinnate; leaflets serrate or nearly entire; stipules not prominent. *Umbels* solitary or in racemes or panicles rarely in compound umbels; pedicels jointed close under the flower or not. *Flowers* often polygamo-monœcious. *Calyx* margin truncate or 5-toothed. *Petals* 5, ovate, imbricate in bud. *Stamens* 5. *Ovary* 2–5-celled; styles 2–5, free or shortly connate at base (at least in the seed-producing flowers). *Fruit* 4–5-celled 4–5-angular, or subglobose 2–3-celled. *Albumen* uniform.—DISTRIB. Species 30; extending from India and Malaya to Japan and North America.

SECT. I. **Ginseng.** Herbs 1–2 feet with a whorl of digitate leaves. *Styles* 2–3. *Fruit* red or red and black, shining, globose, subdidymous.

1. **A. Pseudo-ginseng,** *Benth. in Gen. Pl.* i. 936; leaflets lanceolate with scattered bristles especially on the upper surface. Panax Pseudo-ginseng, *Wall. Pl. As. Rar.* t. 137, *Cat.* 3730; *C. A. Mey. in Gaug. Repert. Pharm. & Chem.* 1842, p. 525, *with fig.*; *Seem. Rev. Heder.* 99.

NIPAL, SIKKIM, and BHOTAN, alt. 6000–12,000 ft., frequent. KHASIA MTS., alt. 5000 ft.; *H. f. & T.*

Rootstock horizontal, tuberous or tuberiferous. *Stem* 6–15 in., erect, smooth, terminated by a whorl of leaves; the scale at its base deciduous or persistent. *Leaflets* 5 rarely 3, 2–6 by ½–1¼ in., acuminate often caudate, rounded or tapering at the base, closely serrate or deeply doubly serrate, glabrous except the scattered bristles; petiole 1–6 in., glabrous; petiolules 0–1 in. *Peduncles* shorter or longer than the leaves, glabrous or nearly so, solitary or 2–4, simple or with 2–5 umbellate heads; pedicels ¼–1 in., pubescent or puberulous; bracteoles ¼ in., narrow lanceolate-linear. *Flowers* polygamo-monœcious; styles in the male flowers sometimes united nearly to their summit. *Fruit* red, or half-black half-red.

Doubtfully separable from the true Ginseng of Japan, *Panax Ginseng, C. A. Mey. l. c.* 524, which differs by having broader, more obovate, less bristly leaves, and not by the characters relied on by C. A. Meyer. The Indian examples show every

form of rootstock and tuber attributed specially to *P. Ginseng* and to *P. quinquefolius, Linn.*: the scale at the base of the stem is persistent even in some of Wallich's specimens.

2. **A. bipinnatifida,** *C. B. Clarke*; leaflets pinnatifid the lobes serrate or bipinnatifid pilose above. Panax bipinnatifidum, *Seem. Rev. Heder.* 100.

SIKKIM HIMALAYA, alt. 8500–11,500 ft.; *J. D. H.*; *C. B. Clarke.*

Generally resembles *A. Pseudo-ginseng*, and perhaps not distinct. *Leaflets* petioluled or sessile, lanceolate acuminate or caudate. *Rootstock* horizontal, quite like that of some examples of *A. Pseudo-ginseng*, and doubtless, like it, produces tubers not rarely.

SECT. II. Shrubs, erect or scandent, or small trees. *Leaves* digitate. *Styles* 5 (or 4). *Fruit* carpels 5–4, ridged on the back.

3. **A. cissifolia,** *Griff.*; *Seem. Rev. Heder.* 91; leaflets 5 rarely 3 lanceolate narrowed at each end, a tuft of fulvous hairs or spines often at the apex of the petiole, umbels simple.—Araliad sp. 4, *Herb. Ind. Or., H. f. & T.*

TEMPERATE HIMALAYA; Kumaon, Sikkim, and Bhotan.

A shrub 10 ft. or erect small tree, branches with short strong deflexed prickles which are sometimes clustered at the nodes. *Petioles* 5 in., glabrous or pubescent, often with scattered prickles; stipules large, ovate, often deciduous; leaflets 2–3 in., lanceolate, acuminate, pilose above; petiolule 0–$\frac{1}{8}$ in. *Peduncles* 2–5 in., solitary, pubescent upwards, carrying each one many-flowered umbel; bracteoles among the pedicels few, linear, small. *Fruit* glabrous.

VAR. 1. *normalis*; a small tree, branchlets and leaves prickly, leaflets fulvous-pubescent beneath doubly serrate, pedicels pubescent. Sikkim; alt. 9000–13,000 ft., Lachen, *J. D. H.* Bhotan; *Griffith* (Kew Distrib. No. 2669).

VAR. 2. *scandens*, Edgew. in Herb.; scandent (?) without spines, glabrous, leaflets simply serrate. Kumaon; alt. 9000 ft., Madhari Pass, *Strachey & Winterbottom.*

SECT. III. **Eu-Aralia.** Erect lax shrubs. *Leaves* 1–3-pinnate. *Styles* 5 (or 4). *Fruit* carpels 5–4, ridged on the back.

4. **A. cachemirica,** *Dcne. in Jacq. Voy. Bot.* 72, t. 81; unarmed no leaflets at the points of division of the leaf-rachis, leaflets elliptic shortly acuminate base often rounded minutely fulvo-pubescent on the nerves above. *Seem. Rev. Heder.* 91; *Brand. For. Fl.* 248. A. macrophylla, *Lindl. in Bot. Reg.* 1844, *Misc.* 73. Panax tripinnatum, *Wall. Cat.* 4934; *G. Don Gen. Syst.* iii. 384. P. decompositum, *Wall. Cat.* 4935; *DC. Prod.* iv. 255.—Araliad sp. 43, *Herb. Ind. Or., H. f. & T.*

TEMPERATE HIMALAYA; from SIKKIM, alt. 7000–8000 ft., to KASHMIR, alt. 9000–12,000 ft.; frequent.

A lax shrub, 5–10 ft. *Leaves* 1–3-pinnate, ultimate pinna with 5–9 leaflets, petiolules 0–$\frac{1}{4}$ in.; leaflets $3\frac{1}{2}$ by $1\frac{1}{2}$ in., often cordate at base, usually simply regularly serrate, pilose above, glabrous or hispid on the nerves beneath. *Umbels* in elongate panicles a foot long, but many smaller panicles occur; bracts $\frac{1}{2}$ in., few, lanceolate, or sometimes leaf-like $1\frac{1}{2}$ in.; panicle-branches and pedicels pubescent.

5. **A. malabarica,** *Bedd. Fl. Sylv.* ii. 121, and *Anal. Gen.* t. 15; aculeate, panicle-branches and pedicels glabrous or sparingly bristly, bracts $\frac{1}{3}$ in. narrow lanceolate acute ciliate.

WESTERN GHATS, from MALABAR to TRAVANCORE: common on the Carcoor Ghat in Wynaad; *Beddome.*

A large shrub, nearly glabrous, with scattered weak prickles and bristles. *Leaves*

2–3 ft., 2-pinnate with a pair of leaflets at each division of the rachis; petiolules 0–1/8 in.; leaflets 3–5½ by 1–1¾ in., 5–9 to each pinna, simply or doubly serrate, ciliate, acuminate, narrowed ovate or cordate (*Beddome*) at the base, when young weakly aculeate, when older nearly glabrous on both surfaces. *Umbels* in a compound spreading panicle, at least 8 in. *Fruit* slightly 10-ribbed (*Beddome*).

6. **A. Thomsonii,** *Seem. Rev. Heder.* 91; prickles short strong, stem upwards fulvous villous and woolly, pedicels ½–¾ in.—Araliad sp. 42, *Herb. Ind. Or., H. f. & T.*

ASSAM; in the plains, *Jenkins.* KHASIA MTS., alt. 2000–4000 ft.; *H. f. & T.*; *C. B. Clarke.*

A large prickly shrub, all parts softly villous. *Leaves* large, 2–3-pinnate, with a pair of leaflets at each division of the rachis, petiolules 0–1/8 in.; leaflets 3–4 by 1½ in., 5–9 to each ultimate pinnule, elliptic, acuminate, base broad, sparingly often very obscurely serrate. *Panicles* 1½ ft., compound; bracts ¼ in., narrow-lanceolate.—Resembles *A. chinensis*, Linn., and *A. montana*, Blume, but differs from both in its long-pedicelled flowers. It is much more hairy than the other Indian *Aralias.*

7. **A. foliolosa,** *Seem. Rev. Heder.* 91; very prickly, leaflets glabrous beneath or sparingly bristly on the nerves, bracts narrow-oblong somewhat obtuse persistent, pedicels glabrous or nearly so. Panax (?) foliolosum, *Wall. Cat.* 4928.—Araliad sp. 44, *Herb. Ind. Or., H. f. & T.*

SIKKIM, alt. 5000 ft., *J. D. H.*; BHOTAN, *Griffith.* KHASIA MTS., *Griffith* (Kew Distrib. No. 2659); alt. 3000–4000 ft.; *H. f. & T.*

A large lax shrub, glabrous or nearly so; prickles short strong spreading. *Leaves* large, 2–3-pinnate, with a pair of leaflets at each division of the rachis; petiolules 0–1/8 in.; leaflets 2–3 by 1–1¼ in., 5–9 to each ultimate pinnule, elliptic, acuminate, usually rounded at the base, sparingly serrate, glabrous or minutely pilose above, pilose on the nerves beneath. *Panicle* 1 ft., compound; pedicels ½–¾ in.

VAR. *sikkimensis*; leaflets more slender more serrate, at their base are often needle-like spines ¼–¾ in., panicle very large.—Sikkim, alt. 2000–5000 ft.; *J. D. H., N. Gamble, C. B. Clarke.*

8. **A. armata,** *Seem. Rev. Heder.* 91; prickly, upper part of stem and petioles glabrous, leaflets pilose on both surfaces, upper part of panicle and pedicels pubescent, bracts 0 or caducous. *Kurz For. Fl.* i. 536. Panax armatum, *Wall. Cat.* 4933; *G. Don Gen. Syst.* iii. 386.—Araliad sp. 45, *Herb. Ind. Or., H. f. & T.*

SIKKIM, alt. 2000–6000 ft., frequent. KHASIA MTS., alt. 2000–4000 ft.; *H. f. & T.* TENASSERIM; *Kurz.* TAVOY; *Wallich.*

A shrub. *Leaves* very large, usually 3-pinnate, with a pair of leaflets at each division of the leaf-rachis; petiolules ⅛ in.; leaflets 4½ by 2 in., 5–9 to each ultimate pinnule, acuminate, round or cordate at the base, distinctly serrate. *Panicle* often 1½ ft., the lower part of the rachis glabrous; pedicels ½–¾ in.—*Panax Finlaysonianum*, Wall. Cat. 4933, from Turong Bay, Cochin China, hardly differs from this except that the leaflets have soft brownish-red hairs on the lower surface instead of bristly hairs.

2. **PENTAPANAX,** *Seem.*

Trees or large scandent shrubs. *Leaves* simply pinnate with 5–9 leaflets, or digitate with 3–5 leaflets glabrous; leaflets entire crenate or serrate. *Flowers* hermaphrodite or polygamous, in compound racemes or umbelled, pedicels jointed close under the flowers. *Calyx*-teeth 5. *Petals* 5, imbricated in bud.

Stamens 5. *Ovary* 5- (or 4-) celled; styles 5–4, combined to the summit or free for more than half their length. *Fruit* 5–4-celled and angled. *Albumen* uniform.—DISTRIB. Species 5, confined to continental India.

* *Flowers in panicled racemes.*

1. **P. racemosum,** *Seem. Rev. Heder.* 21; panicles unisexual elongate oblong with racemes diverging from the rachis divaricately to its summit, styles in the perfect flowers half- or more- free recurved.—Araliad sp. 41, *Herb. Ind. Or., H. f. & T.*

SIKKIM; alt. 6000–8000 ft.; *H. f. & T.*; *Gamble*; *C. B. Clarke.*

A tree 60 ft. (*ex H. f. & T.*), or a large climber (*ex Gamble*). *Leaflets* 4–9 by 2¼–5½ in., usually 5–7, elliptic, acuminate, often rounded or cordate at the base, sinuate-denticulate; petiolules often ½–¼ in. *Panicles* glabrous or villous, often 1 ft. by 4–6 in., 3–9 clustered at the ends of the branchlets; branches 2–3½ in., racemed, flowering from their base; pedicels 0–⅛ in., with a minute linear bract at their bases. *Styles* in the male flowers combined nearly to their summit, in the perfect flowers 3–5, recurved free sometimes almost to the base. *Fruit* (not ripe) small, subglobose; probably less angular and elongate than that of *P. Leschenaultii*; disc not elongate-conical.

2. **P. subcordatum,** *Seem. Rev. Heder.* 22; panicle ovate acuminate, racemes ascending, rachis unbranched upwards, styles combined nearly to their summits. Hedera subcordata, *Wall. Cat.* 4917; *G. Don Gen. Syst.* iii. 394.—Araliad sp. 41, *Herb. Ind. Or., H. f. & T. partly.*

KHASIA MTS., alt. 4000–6000 ft.; *Wallich, Griffith,* &c., not rare.

A small tree. *Leaflets* 3½–4½ by 2 in., usually 3–5, elliptic, acuminate, often rounded or cordate at the base, sinuate-crenate; petiolules often ¼–⅜ in. *Panicles* 8 in., with 3–8 racemed branches ascending from its lower half; panicle-branches 2–4 in., glabrous racemed flowering from their base; pedicels often ¼ in. (rarely 0–1/16 in.), with a minute linear bract at their bases. *Flowers* appear all perfect. *Fruit* (nearly ripe) small, subglobose, obscurely 5-angled, disc not elongate-conical.

** *Flowers umbelled, umbels simply panicled.*

3. **P. parasiticum,** *Seem. Rev. Heder.* 22; leaflets 5 lanceolate entire glaucous beneath. *Brand. For. Fl.* 248. Hedera parasitica, *Don Prodr.* 188; *DC. Prodr.* iv. 265. H. glauca, *Wall. Cat.* 4921; *G. Don Gen. Syst.* iii. 394. Aralia parasitica. *Ham. MS.*

NIPAL; *Hamilton.* KUMAON; *Wallich, Royle.* Binsar, alt. 7,600 ft., *Strachey & Winterbottom.*

Scandent, glabrous. *Leaflets* 2¾ by 1¼ in. (or smaller), scarcely acuminate, base rounded or subacute; petiolules 0–⅛ in. *Panicles* 3–4 in., simple with 2–8 umbels; pedicels ½–¾ in., glabrous. *Styles* long, combined to near the top. *Fruit* (not ripe) small, subglobose, obscurely 5-angled; disc not elongate-conical.

VAR. 1. *khasiana*; pedicels and rachis of panicle pubescent.—Khasia Mts.; Myrung, alt. 5000 ft., *Griffith* (Kew Distrib. No. 2680), *Simons.*

4. **P. Leschenaultii,** *Seem. Rev. Heder.* 22 *partly*; leaflets 3–5 elliptic-acuminate bristle-serrate, fruit ovoid not very angular, disc not elongate-conical. *Bedd. Fl. Sylv. Anal. Gen.* t. 15. Panax Leschenaultii, *DC. Prodr.* iv. 254. P. micranthum, *Wall. Cat.* 4938; *Excl. A.* Hedera Leschenaultii and H. trifoliata, *W. & A. Prodr.* 377; *Wight Ic.* t. 307.—Araliad sp. 39, *Herb. Ind. Or., H. f. & T.*

SIKKIM, alt. 6000–1000 ft.; *J. D. H.* SOUTH DECCAN and CEYLON in the mountains. BURMA, Taong-dong; *Wallich.*

A tree 30–50 ft., or scandent shrub. *Leaflets* 3½ by 2¼ in., 3 (or 5 in Wight's No. 1204), base rounded or cordate; petiolules often ¼–⅜ in. *Panicles* 3–6 in., with 3–6 heads; pedicels ½–¾ in., glabrous or puberulo-pubescent. *Styles* combined nearly to their summits. *Fruit* ⅛ in. long and broad subcampanulate; ribs not prominent.

The typical form of the fruit in the Nilgherries, accurately described and figured by Wight and Beddome, differs from the Himalayan, but the large series of examples bridges over the gap completely.

VAR. *umbellatum*, Seem. Rev. Heder. 22 (sp.); fruit oblong strongly-ribbed, disc often elongate-conical, pedicels glabrous or pubescent. P. Leschenaultii, *Seem. Rev. Heder.* 22, partly; *Brand. For. Fl.* 248. Hedera fragrans, *Don Prodr.* 187, *not of Roxb.* Panax bijugum, *Wall. Cat.* 4937; *C. Don Gen. Syst.* iii. 386, &c.—Temperate Himalaya from Kumaon to Bhotan, alt. 4000–10,000 ft.; common. Khasia Mts., alt. 3000–5000 ft.—Resembles the type except in the fruit: the pedicels are either glabrous, or more or less pubescent. Seemann has marked as *P. Leschenaultii* examples with pubescent pedicels.

3. ARALIDIUM, *Miq.*

Leaves large, simply pinnatifid, glabrous. *Panicles* male or hermaphrodite, males much larger and more compound; pedicels jointed close under the flowers; flowers small. *Calyx*-teeth 5, triangular. *Petals* 5, imbricate. *Stamens* 5. *Ovary* 4–3-celled; styles 4–3, separate, linear-cylindric, stigmatose on all sides. *Fruit* 1-seeded.—DISTRIB. Species 2, Malayan.

1. **A. pinnatifidum,** *Miq. Fl. Ind. Bat.* i. 763, t. 13; leaves 12–18 in. lobed nearly (sometimes quite) to the rachis, panicles upwards and flowers tawny-pubescent.

MALACCA: *Griffith* (Kew Distrib. No. 2702); *Maingay* No. 676.

Lobes of the *leaves* 4–6 by 1-2 in., oblong-lanceolate. *Male panicles* 15 by 12 in., compound, with innumerable minute pubescent flowers. *Petals* pubescent. *Young ovary* with 1 pendulous ovule in each cell. *Fruit* (unripe) ¼ in. long.—Maingay notes "Drupes 1-seeded, cotyledons crumpled leafy." The albumen in the imperfectly ripe seeds seems much ruminated. The seeds of the closely allied *A. dentatum* are 1 in. long.

3.* PANAX, *Linn.*

Shrubs or trees. *Leaves* pinnate or digitate rarely undivided; leaflets entire or serrate. *Umbels* panicled (in Indian species), pedicels jointed close under the flowers. *Flowers* often polygamous. *Calyx-limb* 5-toothed or nearly entire. *Petals* 5, valvate. *Stamens* 5. *Ovary* 2- (rarely 3-) celled; styles 2 (rarely 3), distinct. *Fruit* subcompressed or globose, 2- (rarely 3-) seeded, carpels rounded on the back.—DISTRIB. Species 25, Polynesian, Australian, and Malayan, extending to Mantchuria and Tropical Africa.

1. **P. fruticosum,** *Linn.*; *DC. Prodr.* iv. 254; leaves tripinnate, leaflets lanceolate bristle-serrate, fruit compressed laterally. *Blume Bijd.* 880; *Roxb. Hort. Beng.* 21, *Fl. Ind.* ii. 76; *Wall. Cat.* 4932; *W. & A. Prodr.* 376; *Wight Ic.* t. 573; *Kurz For. Fl.* i. 537. Nothopanax fruticosum, *Miq. Fl. Ind. Bat.* i. pt. i. 765; *Seem. Rev. Heder.* 70.—*Rumph. Amb.* iv. t. 33.

Throughout the warmer parts of INDIA, cultivated.—DISTRIB. Malaya and Polynesia, cultivated; wild state unknown.

A shrub, 3–6 ft. *Leaflets* 2–3 by ¼–½ in., but varying greatly in size and often irregular in shape, usually much setose-serrate or incised, sometimes nearly entire. *Panicles* 3–6 in.; bracts minute, deciduous; pedicels ⅛–⅕ in. *Fruit* ⅛ in. long and broad and $\frac{1}{12}$ in. thick; styles persistent recurved.

4. ACANTHOPANAX, *Dcne. & Planch.*

Shrubs or small trees, glabrous (or in non-Indian species tomentose). *Leaves* palmate or digitate (in Indian species). *Umbels* panicled or subsolitary; pedicels not jointed under the flower. *Flowers* polygamous or hermaphrodite. *Calyx-teeth* 5, small. *Petals* 5–4, valvate. *Stamens* 5–4. *Ovary* 2- (rarely 3–4-) celled; styles 2 at the apex of a conical disc, distinct or combined at the base. *Fruit* laterally subcompressed or subglobose. *Albumen* uniform.—DISTRIB. Species 6; Japan to Malaya, and E. Bengal.

1. **A. aculeatum,** *Seem. Rev. Heder.* 86; glabrous, prickly, leaves digitate, leaflets 3–5 elliptic attenuate at base toothed, umbels in small panicles or solitary, fruit compressed. A. sepium, *Seem. Rev. Heder.* 86. Panax aculeatum, *Ait. Hort. Kew,* v. 482; *Jacq. Ic. Rar.* t. 634; *Wall. Cat.* 4926; *DC. Prodr.* iv. 252. P. Loureirianum, *DC. l. c.* Plectronia chinensis, *Lour. Fl. Cochinch.* 162. Xanthoxylon trifoliatum, *Linn. Sp. Pl.* 1455.—Araliad sp. 5, *Herb. Ind. Or., H. f. & T.*

MISHMEE; *Griffith* (Kew Distrib. No. 2665). KHASIA MTS., alt. 4000 ft., frequent. —DISTRIB. China, Japan.

A shrub or small tree; branches angular; spines short, broad-based, stout, often deflexed. *Leaves* of 3–5 leaflets; petiole 1–2 in., often bearing one or more prickles; leaflets 2 by $\frac{3}{4}$–1 in., subacute, denticulate or serrate, sometimes with a few stiff bristles on the nerves beneath; petiolules usually distinct, $\frac{1}{8}$–$\frac{1}{4}$ in. *Umbels* often solitary; pedicels numerous, $\frac{3}{4}$–1 in. *Fruit* $\frac{1}{5}$ in. long and broad; styles persistent, recurved, united for half their length.—Seemann has marked some of the Kew examples *A. sepium,* others *A. aculeatum,* between which no difference can be discovered, and his diagnosis of *A. sepium* applies to the examples he has marked *A. aculeatum.* It is very doubtful whether *Panax spinosum,* Linn. f. (*Acanthopanax,* Miq.), specifically differs: the leaflets in this seem quite sessile and the prickles are less deflexed.

5. HELWINGIA, *Willd.*

Glabrous under-shrubs. *Leaves* petioled, simple, lanceolate or ovate-lanceolate, bristle-serrate; stipules a tuft of linear bristles seen only at the base of the young petioles. *Umbels* unisexual, simple, very small, sessile about the middle of the back of the leaf, or on phyllodes; females 1–4-flowered; males with more flowers; bracts 0, pedicels not jointed under the flower. *Calyx-margin* obsolete. *Petals* 3–5, valvate. *Stamens* 3–5. *Ovary* 3–4-celled; styles 3–4, combined at base, rising from a conical disc. *Fruit* ovoid or ellipsoid, usually 2–3-celled; carpels rounded on the back. *Seed* compressed; albumen uniform.—DISTRIB. Species 2, an Indian and a Japanese.

1. **H. himalaica,** *Hk. f. & T. ms.*; leaves lanceolate, fruit $\frac{1}{4}$ in. ellipsoid.

SIKKIM, alt. 7000–9000 ft., frequent. EAST HIMALAYA; *Griffith.* KHASIA MTS., alt. 5000–6500 ft., *H. f. & T.*

Stem woody, branched. *Leaves* 3 by 1 in., tapering at both ends; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. *Phyllodes* when present spathulate-oblong, sessile, $1\frac{1}{2}$ in., entire below bristle-serrate near the apex, midrib strong, the wing membranous imperfectly herbaceous. *Flowers* $\frac{1}{20}$ in. diam., greenish. *Fruit* 1–3 on the leaf; pedicels hardly $\frac{1}{8}$ in. *Seeds* narrowly-oblong, compressed, more than twice as long as broad.—This hardly differs from *H. rusciflora,* Willd., which has elliptic (rather than lanceolate) leaves, the fruit shorter subglobose, the seeds less than twice the length of their breadth.

EXCLUDED SPECIES.

Helwingia populifolia, *Spreng. Pugillus* ii. 89, said to be from Bengal, does not belong to the genus.

6. **POLYSCIAS,** *Forst.*

Glabrous trees or large shrubs. *Leaves* pinnate, leaflets coriaceous entire. *Umbels* panicled (in Indian species); bracts $\frac{1}{8}$ in., lanceolate or 0; pedicels jointed under the flower. *Calyx-margin* truncate or toothed. *Petals* 5–4 (in Indian species), valvate. *Ovary* 5–4-celled (in Indian species), summit flat; styles 5–4, distinct. *Fruit* ellipsoid or globose, prominently ribbed. *Seed* compressed; albumen uniform.—DISTRIB. Species 8; E. African Islands, S. India, and Malaya.

1. **P. acuminata,** *Seem. Rev. Heder.* 56; leaflets 5–13 oblong much acuminate, panicle narrowly oblong simple, branches short ending in an imperfect umbel. *Bedd. Fl. Sylv.* t. 213, *excl. syn.* Hedera acuminata, *Wight Ic.* t. 1062; *Thwaites Enum.* 131, *excl. syn.* Eupteron acuminatum, *Miq. Fl. Ind. Bat.* i. pt. i. 762.

DECCAN MTS., alt. 5000 ft.; NILGHIRIS; *Wight.* ANAMALLAYS and TINNEVELLY GHATS; *Beddome.* CEYLON, Adams Peak, alt. 4000–5000 ft.; *Thwaites.*

A tree. *Leaflets* 5 by $1\frac{3}{4}$ in., attenuated at both ends, margin thickened, petiole $\frac{1}{4}$ in. *Panicle* 8–10 by 1–3 in., branches stout, umbel at the end of each subcapitate the pedicels not rising from the same point and being sometimes again divided so that the panicle may be called compound, but the umbels altogether are not above 1 in. diam.; bracts caducous. *Ovary* truncate, ellipsoid, soon becoming distinctly ribbed. *Ripe fruit* not seen. [The Andaman leaves distributed by Mr. Kurz as *Eupteron sp. nov.? Andaman Rep. Suppl.* B. 9 appear to be *Arthrophyllum diversifolium, Blume.*]

2. **P. pinnata,** *Forst. Char. Gen.* p. 64, t. 32; leaflets orbicular subentire or with small remote teeth base cordate. *DC. Prodr.* iv. 257; *Seem. Rev. Heder.* 56. Panax? Heyneanum, *Wall. Cat.* 4927; *G. Don Gen. Syst.* iii. 385. Nothopanax tricochleatum, *Miq. Fl. Ind. Bat. Suppl.* 340. Aralia latifolia, *W. & A. Prodr.* 376.

INDIA? *Wight* No. 1213.—DISTRIB. Malaya, Polynesia.

This plant is noticed here because taken up in *W. & A. Prodr.* and because Dr. Seeman supposed it might be a new genus. Wight's Herbarium specimen is without locality, there is therefore small probability that the plant is Indian.

7. **HEPTAPLEURUM,** *Gaertn.*

Large shrubs or trees, glabrous or tomentose, without prickles. *Leaves* digitate rarely compound-digitate or 1-foliolate; leaflets coriaceous, entire or remotely toothed or lobed, never closely serrate nor ciliate, those near the panicle usually entire; stipules often connate within the petiole and prominent. *Umbels* (rarely capitate) panicled or in compound racemes; bracts woolly, deciduous or persistent; pedicels not jointed under the flower; bracteoles few or 0, or rarely densely tufted. *Calyx-margin* toothed or truncate. *Petals* 5–6 or many, valvate. *Stamens* as many as the petals. *Ovary* cells as many as the petals, disc small or large; styles small, separate or combined in a short conical narrow cylindric column. *Fruit* subglobose, 5–6-angled. *Seeds* compressed; albumen uniform.—DISTRIB. Species 50, in the tropics of the old world.

SUBGEN. I. **Agalma.** *Stigmas* connate into a narrow cylindric style.

† *Umbels perfect, pedicels not racemed.*

1. **H. impressum,** *C. B. Clarke*; leaflets (from leaves near the panicle) lanceolate nearly entire nerves impressed above stellately woolly beneath, petals sparingly stellate-woolly. Agalma tomentosum, *Seem. Rev. Heder.* 25. Hedera tomentosa, *Ham. in Don Prodr.* 187; *Wall. Cat.* 4922; *DC. Prodr.* iv. 264. Panax tomentosum, *DC. Prodr.* iv. 254.—Araliad sp. 13, *Herb. Ind. Or. H. f. & T.*

Temperate Himalaya, alt. 6000–11,000 ft.; from KUMAON to BHOTAN, frequent.

A tree, 60 ft. *Leaflets* often 10 by 2¼ in., rugose above from the impressed nerves, lanceolate or oblanceolate, acuminate; petiolules rarely more than 1 in.; leaflets from young trees often distantly lobed or serrate. *Panicle* 12–15 in., stellate-tomentose; bracts very shortly ovate, somewhat persistent; pedicels ½–¾ in.—Seeman has applied the name *H. tomentosum* to a different Malayan plant: hence the new name *H. impressum.*

2. **H. hypoleucum,** *Kurz For. Fl.* i. 539; leaflets with scattered lax stellate wool or glaucous beneath glabrous and not rugose above, petals covered with dense stellate wool.—Araliad sp. 15, *Herb. Ind. Or. H. f. & T.*

KHASIA MTS., alt. 4000–6000 ft. frequent; *Griffith, H. f. & T., C. B. Clarke.* MARTABAN, alt. 6000 ft.; *Kurz.*

A small branched tree. *Leaflets* 4–8 by 1½–3½ in., those even from leaves next the panicle polymorphous, oblong or ovate, acute, quite entire or serrulate or lobed or irregularly pinnatifid, the stellate wool beneath deciduous, leaving a glaucous surface; petiolules ½–3 in. *Panicle* often 12–15 in., lower branches often elongate with several umbels, stellately woolly; bracts shortly ovate, somewhat persistent; pedicels ⅓–¾ in.—Closely allied to the preceding. From Mr. Kurz's description it would seem that the rarer Khasian form with perfectly glabrous glaucous leaves, is the only Burman one.

3. **H. elatum,** *C. B. Clarke*; leaflets near the panicle nearly entire oblong lanceolate glabrous not rugose above, petals glabrous or sparingly stellate woolly. Hedera elata, *Ham. in Don Prodr.* 187; *DC. Prodr.* iv. 264; *Wall. Cat.* 4914. Agalma elatum, *Seem. Rev. Heder.* 25.—Araliad sp. 6, *Herb. Ind. Or. f. & T.*

KUMAON to BHOTAN, alt. 5000–7000 ft., not uncommon; *Wallich*, &c.

A tree 30–40 ft. *Leaflets* 4–7 by 1–2½ in., broadest below the middle, in young trees but sparingly toothed or lobed; petiolules often 1–2 in. *Panicle* 12–18 in., lower branches usually compound; bracts very short, ovate, auriculate; pedicels ½–¾ in., glabrous pubescent or stellately woolly; buds usually glabrous.

VAR. *Griffithii*; pedicels very woolly, young petals more pubescent. Heptapleurum glaucum, *Kurz For. Fl.* i. 538. Agalma Griffithii. *Seem. Rev. Heder.* 25.—Bhotan; *Griffith* (Kew Distrib. No. 2698 and E. I. C. No. 2064). Burma; Martaban, alt. 5000–7000 ft.; *Kurz*; Moolee Mt., *Parish.*

4. **H. glaucum,** *C. B. Clarke (not of Kurz)*; leaflets near the panicle nearly entire glabrous obovate-lanceolate with impressed nerves above, petals with minute white stellate tomentum. Agalma glaucum, *Seem. Rev. Heder.* 25.—Araliad sp. 14, *Herb. Ind. Or. H. f. & T.*

KHASIA MTS., alt. 4000–6000 ft.; *H. f. & T., C. B. Clarke.* EAST BENGAL; *Griffith* (Kew Distrib. No. 2660).

A small tree. *Leaflets* 6 by 2 in., broadest above the middle, the tertiary nerves impressed above but less deeply than in *H. impressum*, leaflets of young plants with

remote serratures or shallow lobes; petiolules 1 in. *Panicle* much as in *H. elatum*, nearly glabrous or more or less pubescent or stellately woolly.

5. **H. rostratum,** *Bedd. Fl. Sylv.* ii. p. 122; leaflets glabrous lanceolate or elliptic narrowed at both ends coriaceous, tertiary nerves obscure above, petals glabrous or nearly so. Hedera rostrata, *Wight Ic.* t. 1013. Agalma rostratum, *Seem. Rev. Heder.* 25.

NILGHIRIS; *Wight*; *Gardner*, alt. 7000 ft.; *C. B. Clarke.* (The Sikkim locality given by Seeman is an error.)

A small branched tree. *Leaflets* 4½ by 1¼–2 in., entire or denticulate; petiolules ¾–1 in. *Panicle* 8 in., branches often bearing one umbel each only; bracts shortly ovate, persistent; pedicels ½–¾ in., glabrous or stellately pubescent, springing from a dense tuft of permanent bracteoles.

VAR. *micrantha*; flowers and fruit smaller, pedicels and bracteoles glabrous.—Sisparah, Nilghiri Mts., *Wight.*

†† *Pedicels usually racemed.*

6. **H. racemosum,** *Bedd. Fl. Sylv.* t. 214; leaflets glabrous entire narrowed at both ends, pedicels glabrous or often rusty stellately woolly. Hedera racemosa, *Wight Ic.* t. 1015; *Thwaites Enum.* 132. Agalma racemosum, *Seem. Rev. Heder.* 24.

NILGHIRIS; *Gardner*; Canoor, alt. 6000 ft., *Wight.* ANAMALLAY MTS. alt. 3000–5000 ft.; *Beddome.* CEYLON, alt. 3000–5000 ft.; *Thwaites.*

A large tree. *Leaflets* 6 by 2½ in., elliptic or lanceolate, subobtuse or cuspidate, coriaceous, tertiary nerves above obscure; petiolules often 1–1½ in. *Panicle* 6–12 in., the ends of the branches bracts and pedicels rusty pubescent while young; bracts shortly ovate, persistent; pedicels ½ in. *Flowers* at first often umbelled, the fruits usually distinctly racemed.—Closely allied to the preceding species: some of Thwaites' specimens are not racemed at all, even in fruit.

SUBGEN. II. **Eu-Heptapleurum.** *Styles* short, not connate into a narrow cylindric column.

* *Leaves* 1- (rarely 1–3-) foliolate.

7. **H. emarginatum,** *Seem. Rev. Heder.* 44; leaves cuneate-oblong emarginate, panicles 1–2 in., umbels 2–5-flowered. Hedera emarginata, *Moon Cat. Pl. Ceylon*; *Thwaites Enum.* 132.

CEYLON, up to 4000 ft.; *Walker, Thwaites.*

A climbing glabrous shrub. *Leaflets* ¾–1½ by ⅜–¾ in., narrowed at the base, subsessile, broadest at the very summit and there distinctly emarginate or 2-lobed, nerves on both surfaces raised. *Pedicels* ¼ in., spreading; bracts 0 or early fugacious. *Flowers* very small, white tinged red (*Thwaites*).

** Leaves simply digitate; leaflets usually 5–7.

† *Reticulating nerves prominent on the upper surface of the leaflets.*

8. **H. venulosum,** *Seem. Rev. Heder.* 44; leaflets oblong or elliptic acute usually broadest below the middle. *Brand. For. Fl.* 249; *Kurz For. Fl.* i. 538. H. ellipticum, *Seem. Heder.* 43. Paratropia venulosa, *W. & A. Prodr.* 377; *Wight Ill.* t. 118. P. elliptica and macrantha, *Miq. Fl. Ind. Bat.* i. pt. i. 756. Hedera venosa, *Wall. Cat.* 4923. H. terebinthacea, *Wall. Cat.* 4920 *partly.* Aralia digitata, *Roxb. Hort. Beng.* 22, *Fl. Ind.* ii. 107. Sciadophyllum ellipticum, *Blume Bijd.* 878; *DC. Prodr.* iv. 260.—*Rheede Hort. Mal.* vii. t. 28. Araliad sp. 18, *Herb. Ind. Or. H. f. & T.*

Throughout tropical and subtropical INDIA, from the NORTH-WEST HIMALAYA to the SOUTH DECCAN and SINGAPORE.—DISTRIB. Malaya and Tropical Australia.

A small glabrous tree or climbing shrub. *Leaflets* 4 by 2 in., glabrous, entire, acuminate, base subacute or rounded; petiolules 1 in. or larger. *Panicle* small or large; lateral branches sometimes 10 in., compound; bracts caducous, large, ovate, hairy in the young panicle; branchlets and pedicels glabrous or pubescent; pedicels $\frac{1}{8}$–$\frac{1}{4}$ in. *Buds* varying in size, and the disc after flowering is very prominent or not.—The panicle branches become more delicate and the buds smaller in Burma, where the plant is exactly *Paratropia elliptica*, Miq.; while at Malacca the form collected by Dr. Maingay (No. 680) is *P. micrantha*, Miq.

VAR. *macrophylla*, Wall. Cat. 4918 (sp.); leaflets 6–8 in.—Amherst; *Wallich.*

9. **H. stellatum,** *Gaertn. Fruct.* ii. 472, t. 178; leaflets obovate obtuse. *Seem. Rev. Heder.* 45. Hedera obovata, *Wight Ic.* t. 1011. H. Vahlii, *Thwaites Enum.* 132. H. terebinthacea, *Vahl Symb.* iii. 42; *DC. Prodr.* iv. 265; *Wall. Cat.* 4920 *partly.* Paratropia terebinthacea, *Arn. Pugill.* 20.

SOUTH DECCAN PENINSULA; near Coimbatore, *Wight.* NILGHIRI MTS., *Hohenacker* No. 1472. CEYLON, abundant up to 3000 ft. alt.; *Thwaites.*

Altogether resembles *H. venulosum* except as to the obtuse obovate leaflets, and may be merely a South Indian and Ceylon form of it.

10. **H. subulatum,** *Seem. Rev. Heder.* 42; leaflets often 4–3 more rarely 5 oblong or elliptic acuminate, panicles linear. Paratropia subulata, *Miq. in Ann. Mus. Lugd. Bat.* i. 22.

PINANG and MALACCA; *Griffith* (Kew Distrib. No. 2690); *Maingay,* No. 681.—DISTRIB. Sumatra.

Branchlets glabrous. *Leaflets* 5½ by 2½ in., narrowed at both ends, glabrous or rarely with scattered stellate woolly hairs beneath, entire or with a few teeth. *Panicle* in flower 10 by 1 in., in fruit nearly 3 in. broad, when young with scattered white stellate wool; bracts $\frac{1}{4}$ in., lanceolate, stellately white woolly, soon deciduous; branches usually very short, sometimes 1 in.; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in., always stellately tomentose when young. *Fruit* pentagonal, disc large, prominent.—May this be a state of *H. heterophyllum*?.

†† *Leaves coriaceous, tertiary nerves not prominent above.*

11. **H. Wallichianum,** *C. B. Clarke* (*not of Seemann*); pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. glabrous, buds $\frac{1}{8}$ in. broad. H. exaltatum, *Seem. Rev. Heder.* 44. Paratropia Wallichiana, *W. & A. Prodr.* 377. Hedera exaltata, *Thwaites Enum.* 44. H. Wallichiana, *Dalz. & Gibs. Bomb. Fl.* 108.—Araliad sp. 19, *Herb. Ind. Or. H. f. & T.*

SOUTH DECCAN PENINSULA; Kurg, *Wight.* NILGHIRIS, alt. 4000–6000 ft., near Canoor, *C. B. Clarke.* CEYLON, alt. 4000–6000 ft.; *Thwaites.*

A large glabrous tree. *Leaflets* 5–10 by 2½–4 in., oblong or elliptic, acute, rounded at the base, very leathery. *Panicle* oblong, about 12 by 3 in.; buds glabrous, unusually large. *Fruit* crowned by the much enlarged pentagonal disc.

12. **H. khasianum,** *C. B. Clarke*; pedicels $\frac{1}{4}$ in. stellately tomentose when young, buds $\frac{1}{12}$ in. broad. H. Wallichianum, *Seem. Rev. Heder.* 44.—Araliad sp. 20, *Herb. Ind. Or. H. f. & T.*

BHOTAN, Mishmee; *Griffith* (Kew Distrib. No. 2694). KHASIA MTS., alt. 3000–6000 ft.; *H. f. & T.*; *C. B. Clarke.*

Leaflets attain 11 by 3 in., usually much smaller, narrow-oblong or lanceolate, acuminate, glabrous, the base sometimes almost rounded, very coriaceous, entire; petiolules often 1½ in. *Panicle* with white stellate tomentum on the branches pedicels and backs of the petals, often a foot long in fruit; lower branches elongate, ascend-

ing, compound; bracts ¼ in., oblong, acuminate, caducous; pedicels ¼ in. in fruit. *Fruit* globose, hardly pentagonal, disc depressed conical, not pentagonal.

13. **H. Cephalotes,** *C. B. Clarke*; panicle pubescent, flowers sessile, bracts deciduous. H. capitatum, *Seem. Heder.* 45 *partly*.

MALACCA; *Griffith* (No. 2700 Kew Distrib.).

Apparently a large tree. *Leaflets* 14 by 4½ in., oblong-elliptic, acuminate, rounded or little narrowed at the base, coriaceous, entire, shining, glabrous above, with scattered loose woolly hairs that easily wear off beneath; petiolules 3–4 in., stout. *Panicle* 15 in. with stellate pubescence from the base. Heads of *fruit* globose, close packed without bracteoles. *Fruit* much longer than broad, 5–8-ribbed, stellately white-tomentose, crowned by the broad short cluster of styles; disc enlarged, somewhat corky.— Very unlike *Paratropia capitata* W. & A. (a *Brassaia*), with which, regardless of geography, Dr. Seeman united it.

*** Leaves twice digitate or digitately decompound.

14. **H. heterophyllum,** *Seem. Rev. Heder.* 42; leaves twice digitate, panicle narrowly oblong or linear stellately white-pubescent. Hedera heterophylla, *Wall. Cat.* 4919; *G. Don. Gen. Syst.* iii. 394. Paratropia heterophylla, *Presl Epimel. Bot.* 250; *Miq. Fl. Ind. Bat.* i. pt. i. 761.

PINANG; *Wallich.*—DISTRIB. Java.

Branchlets glabrous. *Leaves* digitately 3–4-petioluled, each petiolule bearing 3–4 rarely 5 leaflets; leaflets 4–5 by 1–3 in., oblong or elliptic, acuminate, rounded or somewhat acute at the base, glabrous, entire, membranous; tertiary nerves prominent above, secondary petiolules much varying in length from ⅛–1½ in. at the same cluster. *Panicle* 8–12 by 1–3 in., branches slender, little compound; bracts ⅛ in., ovate-oblong, stellately white tomentose, caducous or sometimes persistent. *Flowers* small. *Fruit* pentagonal.

15. **H. biternatum,** *C. B. Clarke*; leaves digitately decompound or twice pinnate with ternate leaflets at each node of the rhachis.

MALACCA; *Maingay* No. 684.

A small tree; trunk about 3 ft. (*Maingay*). *Leaflets* 5 by ¾ in., linear-oblong, acuminate, unequal subacute at the base, entire, the reticulating nerves prominent on both surfaces, with scattered stellate hairs (easily wearing off) beneath; petiolules 0–$\frac{1}{16}$ in. *Panicle* 8 by 1½ in., branches hardly divided, with scattered stellate hairs; bracts deciduous; pedicels less than ¼ in. *Flowers* small, altogether of a *Eu-Heptapleurum*.—May prove a form of *H. heterophyllum*.

DOUBTFUL SPECIES.

HEDERA MOLLIS; Wall. Cat. 4924; the example consists of leaves only; it may be *Heptapleurum Cephalotes* above.

8. TREVESIA, *Vis.*

Shrubs or small trees, prickly or unarmed, glabrous or stellate-hairy. *Leaves* palmate or digitate; petioles often united by a wing at their base; stipules united within the petiole or obsolete. *Flowers* polygamous, large for the Order; umbels panicled; pedicels not jointed under the flower; bracts small or 0. *Calyx-margin* entire or toothed. *Petals* 8–12, valvate, somewhat thick, often cohering as a cap in the fertile flowers. *Stamens* as many as the petals. *Ovary* with as many cells as the petals; styles united into a small boss or short column. *Fruit* ovoid, large for the Order. *Seeds* compressed; albumen uniform.—DISTRIB. Species 8; inhabiting Eastern India, Malaya and Polynesia.

Hardly separable from *Heptapleurum* by the larger flower and fruit, and the usually more numerous carpels.

1. **T. palmata,** *Vis. in Mem. Acad. Torino,* ser. 2, iv. 262, *with fig.*; leaves large palmate or digitate nearly glabrous, lobes serrate or again lobed, petiolules connected at base by a serrate or lobed wing. *Seem. Rev. Heder.* 77; *Kurz For. Fl.* i. 539. Gastonia palmata, *Roxb. Hort. Beng.* 33, *Fl. Ind.* ii. 407; *Lindl. in Bot. Reg.* t. 894. Gilibertia palmata, *DC. Prodr.* iv. 256. Hedera ferruginea and palmata, *Wall. Cat.* 4909 and 4910 *partly.* Brassaiopsis confluens, *Seem. Rev. Hed.* 18 (*as to the leaves*).—Araliad sp. 30 and 31, *Herb. Ind. Or. H. f. & T.*

From NIPAL and SIKKIM to PEGU, alt. 1000–5000 ft., frequent.

A small tree 10–15 ft., the shoots with reddish hair and many prickles. *Leaves* 1–2 ft., adult glabrous or with scattered stellate hairs on both surfaces deeply palmate, in young plants often digitate; petiole often prickly. *Panicles* 18 in., straggling, young with red-brown tomentum; bracts 1 in., oblong, usually deciduous; pedicels 1–1½ in. *Buds* exceeding ¼ in. diam. *Fruit* ⅝ by ½ in., ovoid, glabrate, ribs not prominent, crowned by the stout style.

VAR. 1. *insignis,* Miq. in Ann. Mus. Lugd. Bat. i. 220 (sp.); leaves very large, segments lobed or subpinnatifid. Khasia Mts.; *Griffith* No. 2664 (Kew Distrib.).

VAR. 2. *cheirantha*; leaves palmate nearly glabrous, lobes serrate, petiolules when present with entire wing. *Hedera ? Aralia,* Jack in Wall. Cat. 4925. Chittagong, alt. 0–1000 ft.; *H. f. & T.* Pinang and Malay Peninsula, *Porter, Sir W. Norris*; *Wall. Cat.* 4910 *partly.* Malacca, *Griffith* (No. 2661 Kew Distrib.).—Distrib. Philippines.—These are the examples (leaves only) referred in *Gen. Pl.* i. 943 to *T. sundaica,* Regel (Gartenfl. 1864, t. 438, not of Miquel). In *T. palmata* the young plants only, and only occasionally, produce digitate leaves; and such are often only imperfectly digitate, the central leaflets being frequently petioluled the lateral leaflets continuous. There may be more than one species of *Trevesia* here included, but no species can be founded on imperfectly digitate leaves. One sheet of *Wall. Cat.* 4910, marked *Hedera confluens,* consists of the fruit of *Brassaiopsis* (probably *B. Hainla*) mixed with leaves of *Trevesia* and constitutes the *Brassaiopsis confluens,* Seem. Rev. Heder. 18.

9. BRASSAIA, *Endl.*

Unarmed glabrous trees. *Leaves* digitate; leaflets large, leathery, entire; stipules united within the petiole. *Panicle* stout, long, branches mostly undivided; umbels contracted into heads; each flower surrounded by 4 ovate bracteoles, as long as the ovary and united below into a tube. *Calyx-margin* entire or nearly so. *Petals* 6–18, valvate, thick. *Stamens* as many as the petals. *Ovary* cells as many as the petals; styles very short, scarcely united as a short cone. *Fruit* obconic and ribbed below, hemispheric above. *Seed* compressed; albumen uniform.—DISTRIB. Species 2, extending from the Deccan Peninsula to Northern Australia.

Separated from *Heptapleurum Cephalotes* by the floral bracteoles.

1. **B. capitata,** *C. B. Clarke*; bracts at the base of the panicle-branches ovate short very persistent, petals and carpels 6–10. Heptapleurum capitatum, *Seem. Rev. Heder.* 45 *partly.* Paratropia capitata, *W. & A. Prodr.* 378.

NILGHERRY MTS., Kotagherry and Vellyengry Hill; *Wight.*

Leaflets 6–8, 6 by 2½ in., elliptic-oblong subacute, somewhat rounded at the base, very coriaceous, entire; petiolules 2 in., very stout. *Panicle* 16 by 3–4 in., branches very stout.—Doubtfully separable from *B. actinophylla,* Endl. (see *Benth. Fl. Austral.* iii. 385) by its persistent bracts, less numerous flower-parts. Wight's examples are very good, but the species seems rare, as Col. Beddome has never met with it.

10. **DENDROPANAX,** *Dcne. & Planch.*

Trees or shrubs, glabrous, unarmed. *Leaves* simple, entire, on young shoots polymorphous, palmately 3–5-lobed; stipules small, scarcely united within the petiole. *Umbels* solitary or in small panicles; bracts small or 0; pedicels not jointed under the flower. *Calyx-margin* entire or 5-toothed. *Petals* 5, valvate, somewhat thick. *Stamens* 5. *Ovary* 5-celled; styles united into a column at the base, their summits (in the Indian species) spreading. *Fruit* globose or ellipsoid, distinctly or obscurely 5-ribbed. *Seeds* compressed; albumen uniform. —DISTRIB. Species 20, mostly tropical American; four species in China, Japan, and E. India.

1. **D. japonicum,** *Seem. Rev. Heder.* 27; leaves densely glandular, fruit ellipsoid much longer than broad distinctly ribbed. Hedera japonica, *Jungh. in Walp. Rep.* ii. 431 (*ex Seem.*).—Araliad sp. 34, *Herb. Ind. Or. H. f. & T.*

KHASIA MTS,, alt. 4000–5000 ft.; *H. f. & T.*; *Griffith* (Kew Distrib. No. 2681, 2679).—DISTRIB. Japan.

Appears to be an erect shrub or very small tree. *Leaves* (those near the umbels) 4 by 2–3 in., oblong or elliptic, acute, entire, 1–3–5-nerved from the base; petiole ½–2 in.; polymorphous leaves on young shoots sometimes 8 in. diam., deeply 3–5-palmated; segments narrowly lanceolate, often remotely and minutely toothed; petiole 6–8 in. *Umbels* solitary or 2–3, panicled; pedicels ½ in. *Fruit* ⅜ by ⅓ in., somewhat pentagonal.

2. **D. parviflorum,** *Benth. Fl. Hongk.* 137; leaves not densely glandular usually 3-nerved at the base oblong or elliptic acute, fruits subglobose obscurely ribbed. *Seem. Rev. Heder.* 27. Hedera parviflora, *Champ. in Hook. Kew Journ. Bot.* iv. 122.

Mount Ophir, MALACCA; *Griffith* (Kew Distrib. No. 2685); *Maingay*, No. 682.—DISTRIB. Hongkong.

Apparently an erect shrub. *Leaves* 3½ by 2¼ in., entire or very obscurely toothed, glands not visible on the young leaves even; petiole ¼–1½ in. *Umbels* mostly solitary; pedicels ½ in. *Fruit* ¼ in. diam.—The branchlets from Mount Ophir have all entire leaves as they carry umbels; the Hongkong young shoots have polymorphous palmate leaves. *D. proteum,* Benth. Fl. Hongk. 136, has the upper leaves very narrowly lanceolar, mostly 1-nerved from the base, but is perhaps only a variety of the present species.

11. **ARTHROPHYLLUM,** *Blume.*

Shrubs or small trees, unarmed. *Leaves* glabrous or nearly so, lower usually alternate and compoundly pinnate, uppermost opposite and simple, intermediate 3-foliolate; leaflets easily separable from the rhachis; stipules united within the petiole. *Peduncles* mostly forming a terminal umbel, each ending in a simple (or slightly compound) umbel of flowers; bracts very small; pedicels not jointed under the flower. *Calyx-teeth* 5, small. *Petals* 5, valvate. *Stamens* 5. *Ovary* 1-celled 1-ovuled; style short, simple. *Fruit* (in the Indian species) ovoid, not angular. *Seed* subglobose; albumen ruminated.—DISTRIB. Species 3, Malayan.

1. **A. diversifolium,** *Blume Bijd.* 879; leaves near the umbels usually all simple, leaflets subobtuse or shortly acuminate. *DC. Prodr.* iv. 266;

Miq. Fl. Ind. Bat. i. pt. i. 767. A. javanicum, *Blume Bijd.* 879; *DC. l.c.*; *Kurz For. Fl.* i. 540. A. ellipticum, *Blume* and *DC. ll.c.* A. Blumeanum, *Zoll. & Mor. Verz.* 41; *Miq. l. c.* i. 768. A. ovalifolium, *Jungh. & De Vriese in Miq. l.c.* t. 14. Panax polycarpum, *Wall. Cat.* 4930. P. Jackianum, *Wall. Cat.* 4931. Hedera Jackiana, *G. Don Gen. Syst.* iii. 394. H.? ovata, *Wall. Cat.* 4911. Eupteron sp. nov. *Kurz Andam. Rep. Suppl.* B 9.

SOUTH ANDAMAN, *Kurz.* PINANG, *Phillips.* MALACCA, *Griffith,* &c.—DISTRIB. Throughout Malaya.

Lower leaves a yard across, decompound-pinnate, with pairs of opposite leaflets at the divisions of the main rhachis, upper smaller simply pinnate, uppermost 1–3-foliolate; leaflets 3 by 1½ in., oblong or elliptic, glabrous, entire, reticulations distinct; petiolule 0–⅕ in. *Peduncles* 2 in., stout, many in the umbel, with very small acute scattered bracts or naked; pedicels ¼ in., quite glabrous even when young, or with more or less rusty stellate wool. *Fruit* ¼ by ⅕ in.

2. **A. pinnatum,** *C. B. Clarke*; uppermost leaves usually 3-foliolate or pinnate, leaflets much acuminate often obtusely. Panax pinnatum, *Lamk. Dict.* ii. 715; *DC. Prodr.* iv. 254; *Wall. Cat.* 9057. P. secunda, *Schultz Syst.* vi. 215. Nothopanax? pinnatum, *Miq. Fl. Ind. Bat.* i. pt. i. 766.—*Rumph. Amb.* iv. t. 32.

PINANG; *Wallich, Maingay,* No. 679. MALAY PENINSULA, *Griffith, Maingay,* No. 677.—DISTRIB. Malay Islands.

Leaves pinnate and 2-pinnate, leaflets sometimes ternate; uppermost often pinnate with 5–17 leaflets, but sometimes with only 3–1 leaflets; leaflets varying greatly in size on the same branchlet, much narrowed to both ends, reticulations obscure, glabrous, entire; petiolule 0–⅛ in. *Peduncles* usually much fewer than in *A. diversifolium* and evidently only pseudo-terminal; pedicels glabrous or with rusty stellate wool. *Flowers* yellow (*Maingay*) and *fruits* nearly as in *A. diversifolium.*—The fruits are said by Miquel to be sometimes 2-seeded, but all the Kew examples are 1-seeded. Both Rumphius and Maingay note two forms of this plant, which are, however, connected by a series of intermediates:

VAR. *latifolia,* Rumph l.c.; leaflets few 4 by 1¼ in. A. pinnatum, *Maingay MS.*, No. 679.

VAR. *angustifolia,* Rumph l.c.; leaflets many 1¼ by ⅛ in. A. alternifolium, *Maingay MS.*, No. 677.

12. HETEROPANAX, *Seem.*

A small unarmed tree. *Leaves* glabrous or nearly so, very large, pinnately decompound; stipules not prominent. *Panicles* large; umbels racemed, more or less stellate-hairy; bracts small, ovate, obtuse, persistent; pedicels not jointed under the flower. *Flowers* polygamous, the terminal umbel of each panicle-branch usually alone fruiting. *Calyx-margin* nearly entire. *Petals* 5, valvate. *Stamens* 5. *Ovary* 2-celled; styles 2, distinct from the base, spreading. *Fruit* much laterally compressed, 2-seeded. *Seeds* compressed; albumen ruminated. —DISTRIB. Species 1 or 2; Western Himalaya, Java, China.

1. **H. fragrans,** *Seem. Rev. Heder.* 73; leaves often a yard across with pairs of opposite leaflets at the nodes of the rhachis. *Brand. For. Fl.* 249; *Kurz For. Fl.* i. 541. Panax fragrans, *Roxb. Hort. Beng.* 21, *Fl. Ind.* ii. 76; *Wall. Cat.* 4929; *DC. Prodr.* iv. 254, *excl. syn. of Don.*—Araliad sp. 47, *Herb. Ind. Or. H. f. & T.*

From the SEWALIK HILLS to BURMA, alt. 0–4000 ft.; common in BENGAL.—DISTRIB. Java, China.

Leaflets 3½ by 1¾ in., elliptic, shortly acuminate, little narrowed at the base, glabrous, entire, nerves not very prominent; petiolules 0–¼ in. *Panicle* often 12–16 in., branches 4–8 in.; umbels dense subcapitate in flower; pedicels in fruit elongating to ¼ in. and more. *Fruit* ¼ by ⅓ in. and ⅛ in. thick, ultimately glabrous and often glaucous.

VAR. 1. *typica*; leaflets elliptic shortly acuminate, base slightly narrowed.

VAR. 2. *subcordata*; leaflets ovate shortly acuminate, base rounded or even cordate.

VAR. 3. *attenuata*; leaflets 4½ by 1¼ in., attenuate acuminate, much narrowed at base.—Bengal Plain. China.—This may be a distinct species.

13. **BRASSAIOPSIS,** *Dcne. & Planch.*

Large shrubs or trees, glabrous or tomentose, armed or not. *Leaves* digitate or palmate or angled; stipules connate within the petiole, not prominent. *Umbels* in large compound panicles, young parts at least stellately tomentose; bracts not large, often persistent; pedicels rising from a dense cluster of persistent bracteoles, not jointed under the flower; flowers often polygamous. *Calyx* 5-toothed. *Petals* 5, valvate. *Stamens* 5. *Ovary* 2-celled; styles 2, united, long or short. *Fruit* broadly globose or turbinate, 2- or by abortion 1-seeded. *Seed* not compressed; albumen ruminated.—DISTRIB. Species 10, from Nipal to Java.

* *Leaves undivided.*

1. **B. simplicifolia,** *C. B. Clarke*; upper leaves simple lanceolate serrate, adult glabrous.

MISHMEE; *Griffith* (Kew Distrib. No. 2699).

Branchlets prickly, glabrous or with a little hard close tomentum. *Leaves* near the panicle alone seen (the lower may be divided) 9 by 3¼ in., acute, subacute at the base, sharply serrated, membranous, nerves much elevated; petiole 1¼ in.; stipules not prominent. Young *panicle* 5 in., nearly glabrous, branches slightly compound; bracts ¼ in., lanceolate; pedicels ¼ in. with scattered stellate hairs, rising from a dense tuft of bracteoles.—Marked by Seemann as new genus, with a note that the petals are imbricate. They are, however, valvate, and it is clearly a *Brassaiopsis.*

2. **B. Hainla,** *Seem. Rev. Heder.* 18, *partly*; leaves divided less than half-way down into triangular cuspidate segments, fruit broadly orbicular. Brassaiopsis confluens, *Seem. Rev. Hed.* 18 (*as to the fruit*). Hedera Hainla, *Ham. in Don Prodr.* 187; *DC. Prodr.* iv. 253. Panax curcifolia, *Griff. Itin. Notes*, 145.—Araliad sp. 28, *Herb. Ind. Or. H. f. & T.*

TEMPERATE HIMALAYA, alt. 3000–6000 ft., from NIPAL to BHOTAN; *Griffith* (Kew Distrib. No. 2668); *J. D. H.*; *C. B. Clarke.*

A small tree, the ends of the branches prickly, young parts stellately tomentose. *Leaves* 4–9 in. diam., truncate or cordate at the base, subspinose-toothed, finally glabrous above and nearly so beneath the hispidulous or stellate hairs distantly scattered. *Bracts* to the panicle-branches ovate, short, densely stellate-tomentose, persistent. *Buds* densely stellate-tomentose. *Pedicels* ½–¾ in., rising from a dense cluster of bracteoles ⅛ in. oblong and very tomentose. *Fruit* ¼ by ¼ in., globose, subdidymous. *Style* ⅛ in. on the fruit.

3. **B. palmata,** *Kurz For. Fl.* i. 537; leaves palmate divided about half-way down into oblong acute segments, fruit ellipsoid or turbinate, longer than broad. Panax palmatum, *Roxb Hort. Beng.* 21, *Fl. Ind.* ii. 74. Araliopsis andamanica, *Kurz in Andaman Rep. App.* B. 9. Hedera polyacantha, *Wall. Pl. As. Rar.* t. 190.—Araliad sp. 33, *Herb. Ind. Or. H. f. & T.*

NIPAL; *Wallich.* SIKKIM TERAI; *J. D. H.* Subtropical zone of EAST BENGAL and BURMA. CHITTAGONG; *Roxburgh, J. D. H.* BURMA; *Griffith* (Kew Distrib. No. 2663). SOUTH ANDAMAN; *Kurz.*

Closely resembles *B. Hainla*; sparingly prickly. *Pedicels* springing from a dense cluster of bracteoles $\frac{1}{8}$ in., oblong and very tomentose. *Fruit* often 1-seeded, when 2-seeded it is $\frac{1}{2}$ by $\frac{3}{8}$ in., turbinate-ellipsoid. *Style* on the fruit $\frac{1}{8}$ in. or rather more. —Wallich's plate belongs to this plant, as he mentions the fruit as turbinate (as also does Roxburgh). *Aralia palmata,* Lour. Fl. Cochinch. 187, doubtfully referred here by Seeman, is an *Acanthopanax.*

4. **B. alpina,** *C. B. Clarke*; leaves cordate-ovate acute or slightly 3–5-cuspidate densely stellate-tomentose, bracts to the panicle-branches lanceolate. —Araliad sp. 27, *Herb. Ind. Or. H. f. & T.*

ALPINE SIKKIM, alt. 10,000–11,000 ft.; Tonglo and Lachen, *J. D. H.*

An unarmed tree, 30 ft.; young branches densely villous and tomentose with yellow or brown stellate hair. *Leaves* 4–5 in. and nearly as wide, softly serrate, membranous, thickly tomentose on both surfaces when young, when older the scattered stellate hairs wear off, but much remains on both surfaces. *Panicle* (very young) densely tomentose; buds completely enclosed in thick stellate wool; bracts at the base of the panicle-branches $\frac{1}{4}$ in., very narrow.—Can this be a woolly alpine form of *B. Hainla*?

5. **B. hispida,** *Seem. Rev. Heder.* 18; stem panicle and petioles prickly, leaves deeply palmate spinosely serrate, reticulating nerves beneath much raised and ultimately nearly glabrous.—Araliad sp. 30, *Herb. Ind. Or. H. f. & T. partly.*

SIKKIM, alt. 6000–7000 ft.; *J. D. H.* MISHMEE; *Griffith* (Kew Distrib. No. 2696).

Yellowish when dried; prickles numerous and often whorled, lanceolate, compressed, deflexed. *Leaves* 1 ft. diam. and more, segments oblong-lanceolate narrower towards the base, coriaceous, lower surface glabrous or sparingly hispidulous; stipules united within the petiole with two free linear points. *Panicle* very large; bracts to the branches $\frac{3}{4}$ in., lanceolate, tomentose, persistent; pedicels very many, rising amid numerous bracteoles $\frac{1}{8}$–$\frac{1}{5}$ in. lanceolate closely tomentose. Young *calyx-tube* closely densely stellate-tomentose. *Petals* glabrous, appear yellow. *Style* after the petals have fallen scarcely $\frac{1}{16}$ in. *Fruit* not seen.

6. **B. mitis,** *C. B. Clarke*; branches prickly, leaves deeply palmate softly serrate, the reticulating nerves scarcely raised beneath ultimately pubescent or hispidulous.—Araliad sp. 29, *Herb. Ind. Or. H. f. & T.*

SIKKIM, alt. 4000–8000 ft., not rare; *J. D. H., C. B. Clarke, N. Gamble.*

An erect small tree, 20 ft., the panicle and petioles usually without prickles. *Leaves* 1 ft. diam. and more; segments oblong-lanceolate, narrowed towards the base, membranous, adult beneath softly hairy and not shining; stipules large, lanceolate-subulate, nearly distinct. *Panicle* very large, often with dense bundles of bristles on the rachis and at the top of the petiole; bracts on the branches $\frac{3}{4}$ in., lanceolate, caducous; pedicels very many, arising amid numerous lanceolate closely-tomentose bracteoles $\frac{1}{8}$–$\frac{1}{5}$ in. Young *calyx-tube* more or less stellate-tomentose. *Petals* glabrous. *Style* after the petals have fallen $\frac{1}{5}$ in.; the disc large, subhemispheric. Ripe *fruit* not seen.

7. **B. Griffithii,** *C. B. Clarke*; leaves very large palmate divided halfway down or more serrate-denticulate, adult glabrous or the nerves beneath minutely hispidulous.

EAST BENGAL; Namroo (? Upper Assam), *Griffith* (Kew Distrib. No. 2697).

No prickles seen on the end of the branchlets nor elsewhere. *Leaves* 16 in. diam.; lobes oblong or elliptic, acuminate, tertiary nerves prominent on both surfaces.

Panicle very large and compound, much more glabrous than in the allied species; bracts to the branches short, ovate, persistent; pedicels $\frac{3}{4}$ in., very numerous, bracteoles at their base minute. Young *calyx-tube* sparingly stellate-tomentose, limb distinctly toothed. *Disc* of the young *fruit* much elevated; style scarcely $\frac{1}{20}$ in. *Fruit* $\frac{1}{5}$ in. diam., globose.

** *Leaves digitate.*

8. **B. speciosa,** *Dcne. & Planch. in Revue Hort.* 1854, 106; petiolules long, leaflets lanceolate or elliptic rounded or attenuate at the base entire crenulate or lightly subserrate, adult glabrous or nearly so beneath. *Seem. Rev. Heder.* 19. B. floribunda, *Seem. Rev. Heder.* 19. Hedera floribunda, *Wall. Cat.* 4912; *G. Don Gen. Syst.* iii. 394. H. glomerulata, *DC. Prodr.* iv. 265; *Hook. Bot. Mag.* t. 4804; *Regel in Gartenfl.* 1863, t. 411. Aralia glomerulata, *Blume Bijd.* 872. Macropanax glomerulatum, *Miq. Fl. Ind. Bat.* i. pt. i. 764.—Araliad sp. 9, 10, and 11, *Herb. Ind. Or. H. f. & T.*

From NIPAL and ASSAM to CHITTAGONG; alt. 0–5000 ft., frequent.—DISTRIB. Java.

A small tree; upper part of the branches (and sometimes the panicle also) prickly; innovations stellately tomentose often rusty reddish brown. *Leaflets* 4–8 by 1–3 in., when young often with scattered stellate hairs above and some clustered stellate wool beneath, acuminate, herbaceous, reticulations moderately conspicuous; petiolules usually more than 1 in., summit of the petiole without dense clustered bristles. *Panicle* large, usually a foot long or more; bracts at the base of the branches oblong or lanceolate, persistent; pedicels $\frac{3}{4}$ in. rising from a dense cluster of rusty stellately hairy persistent bracteoles $\frac{1}{5}$ in. *Fruit* $\frac{1}{4}$ by $\frac{3}{8}$ in., didymo-globose, or 1-seeded and subglobose.—There are many forms of this plant, but these being large, it is not easy to establish species upon them. In the young fruit the disc is sometimes very elevated, and the style is long or short, as mentioned by Dcne. & Planchon: the calyx-tube of the young fruit is shortly hemispheric, or more often long and obconic. These differences appear to depend on the stage of ripening at which the fruit is gathered.

VAR. 1. *typica*; leaflets $6\frac{1}{2}$ by 2 in. oblong acuminate entire, base not rounded under surface of the adult glabrous. *Wall. Cat.* 4912.

VAR. 2. *subovata*; leaflets 7 by $4\frac{1}{2}$ in. ovate or elliptic shortly suddenly acuminate entire or very nearly so base rounded adult glabrous beneath.—Sikkim, *J. D. H.*

VAR. 3. *hirta*; leaflets 5 by $1\frac{1}{4}$ in. lanceolate narrowed to both ends entire midrib beneath when young with needle-like spreading hairs (unlike those of any other plant in the order).—The leaflets are detached from the panicle, but except as to the hairs they appear to belong to the species. Cachar, *R. L. Keenan.*

VAR. 4. *rufo-stellata*; leaflets oblong-lanceolate from a rounded base somewhat closely denticulate-serrate in nearly their whole extent with scattered rusty-stellate hairs above, when young rusty villose pubescent beneath, panicle densely rufous-stellate tomentose.—Chiefly from low levels in Cachar, Khasia, and Chittagong.

VAR. 5. *serrata*; leaflets 7 by $2\frac{1}{2}$ in. elliptic-lanceolate dentate-serrate base subacute, panicle very sparingly stellate-woolly. Darjeeling, *Griffith* (Kew Distrib. No. 2689).

9. **B. Hookeri,** *C. B. Clarke*; petiolules distinct or long, leaflets very large oblong narrowed at each end serrate, mature more or less stellate-woolly beneath.—Araliad sp. 12, *Herb. Ind. Or. H. f. & T.*

SIKKIM, alt. 2000–5000 ft.; Yoksun, *J. D. H.* KHASIA MTS., alt. 4000 ft.; Nunklow, *H. f. & T.*

A small prickly tree. *Leaflets* attaining 18 by 8 in., somewhat leathery, nerves above subimpressed; petiolules $\frac{1}{2}$– 2 in. *Panicle* 2 ft., the branches more than a foot with broad oblong persistent bracts at their base, the young parts densely white

stellate-woolly; pedicels $\frac{1}{2}$–$\frac{3}{4}$ in., stout, rising from numerous persistent bracteoles $\frac{1}{5}$ in., less hairy than those of *B. floribunda*. Young *fruit* much as in *B. floribunda*; calyx-tube campanulate or obconic; disc prominently rayed, not greatly elevated; style $\frac{1}{8}$ in.—Possibly a large form of *B. floribunda*.

10. **B. aculeata,** *Seem. Rev. Heder.* 19; leaflets serrate attenuate at base subsessile and often enveloped densely by bristles with stellate hairs on both surfaces when adult. Hedera aculeata, *Don Prodr.* 187; *DC. Prodr.* iv. 264. H. æsculifolia, *Wall. Cat.* 4913. Agalma æsculifolium, *Seem. Rev. Heder.* 25.

KUMAON; *T. Thomson.* NIPAL; *Wallich.* KHASIA MTS., alt. 4000 ft., *C. B. Clarke.*

A small prickly tree. *Leaflets* 9 by $2\frac{3}{4}$ in., narrowly lanceolate-obovate, acuminate, herbaceous, soft in texture, rusty stellate-tomentose, apex of the petiole very hispid; in one example of Dr. Thomson's the digitate leaf is sometimes replaced by a single entire leaf cordate at base. *Panicle* large, compound, greatly resembling that of *B. floribunda*, young parts stellate rusty-woolly; bracts at the base of the branches ovate, short, persistent; pedicels $\frac{1}{2}$–$\frac{3}{4}$ in., springing from a dense cluster of lanceolate hairy persistent bracteoles $\frac{1}{5}$ in. *Fruit* $\frac{1}{4}$ in. long and broad, globose, subdidymous; disc on the ripe fruit flat; style $\frac{1}{8}$–$\frac{1}{5}$ in.—Wallich's *Hedera æsculifolia*, in the Linnæan Society's herbarium, and those marked *Agalma æsculifolium* in the British Museum by Seemann, are all 2-ovuled, and identical with *Brassaiopsis aculeata*.

14. MACROPANAX, *Miq.*

Unarmed small trees. *Leaves* digitate, 3–5-foliolate, leaflets entire or serrate, in the Indian species glabrous; stipules shortly connate within the petiole or 0. *Panicles* large, branched; bracts small, deciduous; pedicels jointed under the flowers; flowers umbelled, polygamous. *Calyx-teeth* 5. *Petals* 5, valvate. *Stamens* 5. *Ovary* 2-celled; styles united. *Fruit* ovoid or subglobose or somewhat elongated upwards, striated or ribbed but hardly angular. *Seeds* dorsally compressed; albumen ruminated or very rugose.—DISTRIB. Species 2, Nipal to Java.

1. **M. oreophilum,** *Miq. Fl. Ind. Bat.* i. pt. i. 764; leaflets usually denticulate serrate or crenulate, panicle-branches spreading stellately rusty-tomentose. *Seem. Rev. Heder.* 20; *Kurz For. Fl.* i. 541. M. floribundum, *Miq. Fl. Ind. Bat.* i. pt. i. 764. Panax serratum, *Wall. Cat.* 4915; *DC. Prodr.* iv. 253. Aralia disperma, *Blume Bijd.* 872. Hedera disperma, *DC. Prodr.* iv. 265.—Araliad sp. 8, *Herb. Ind. Or. H. f. & T.*

From NIPAL and ASSAM to TENASSERIM, alt. 500–7000 ft., frequent.—DISTRIB. Malaya.

Attains 30 ft. *Leaflets* 5 by $1\frac{1}{2}$ in., lanceolate, acuminate, sometimes longer and very narrow, sometimes almost elliptic, base narrowed or rounded; petiolules 1–3 in. *Panicle* 1 ft., compound; bracts usually deciduous, inconspicuous; pedicels $\frac{1}{2}$ in., stout, more or less stellate-hairy, the bracteoles few or deciduous. *Fruit* $\frac{1}{4}$ in., ovoid, sometimes elongated upwards; disc large, conical, often wider than the top of the fruit, crowned with the permanent style $\frac{1}{8}$–$\frac{1}{5}$ in.

2. **M. undulatum,** *Seem. Rev. Heder.* 20; leaflets entire or very nearly so, panicle-branches ascending glabrous. Hedera undulata, *Wall. Cat.* 4916; *G. Don Gen. Syst.* iii. 394.—Araliad sp. 5, *Herb. Ind. Or. H. f. & T.*

SIKKIM, BHOTAN, ASSAM and KHASIA, alt. 500–5000 ft., common. SILHET station.

A small tree. *Leaflets* 3–4 by $1\frac{1}{4}$ in., lanceolate, acuminate, rarely elliptic,

lanceolate, entire rarely minutely denticulate, base narrowed often very acute; petiolules ½–2 in. *Panicle* 1 ft., compound; bracts ⅛ in., triangular, caducous; pedicels ½ in., angular, perfectly glabrous; bracteoles 0 or caducous. *Fruit* as in *M. oreophilum.*

15. HEDERA, *Linn.*

Shrubs, climbing extensively, or small trees. *Leaves* simple, lobed or pinnate, glabrous; stipules 0. *Flowers* polygamous; umbels panicled; bracts very small, pedicels not or very obscurely jointed under the flowers. *Calyx-margin* 5-toothed or sub-entire. *Petals* 5, valvate. *Stamens* 5. *Ovary* 5-celled; styles connate into a column. *Fruit* globose, almost berried. *Seeds* ovoid; albumen ruminated.—Species 2; one in all temperate regions of the Old World; the other Australian.

1. **H. Helix.** *Linn.*; *DC. Prodr.* iv. 261; leaves simple, panicle not elongated. *Don Prodr.* 187; *Wall. Cat.* 4908; *Roxb. Fl. Ind. ed. Carey & Wall.* ii. 515; *Brand. For. Fl.* 248.

Throughout the HIMALAYA alt. 6000–10,000 ft.; KHASIA MTS., alt. 4000–6000 ft.; not rare.—DISTRIB. From W. Europe to Japan.

Stem glabrous climbing adhesively by means of numerous extra-axillary rootlets. *Leaves* 3–4 in., varying from linear-lanceolate to cordate-ovate, entire or variously lobed palmate or subpinnatifid; petiole ½–2 in. *Panicle* often depressed, subcorymbose, or shortly ovate, never large compound; bracts scarcely ⅛ in., triangular; pedicels ½–¾ in., stellately hairy; bracteoles minute or 0. *Fruit* black, more rarely yellow or red.—There is no note of red fruit from India; yellow fruit is not uncommon there.

16. HEDEROPSIS, *C. B. Clarke.*

A glabrous unarmed tree. *Leaves* 1–3-foliolate; leaflets lanceolate, denticulate or nearly entire; base of petiole much dilated; stipules inconspicuous. *Umbels* panicled; bracts and bracteoles deciduous; pedicels jointed close under the flowers. *Calyx* margined, 5-toothed somewhat prominently. *Petals* 5, valvate. *Stamens* 5. *Ovary* 5-celled; styles connate. *Fruit* berried, large, subglobose, crowned by the stout persistent style. *Seeds* 5–4; albumen ruminated.

Differs technically from *Hedera* in the jointed pedicels: the serrate leaflets and large fruit give to it a widely different aspect.

1 **H. Maingayi,** *C. B. Clarke.*

MALACCA; *Maingay*, No. 683.

Leaflets of the compound leaves 3½ by 1½ in., simple leaves attain 8½ by 4 in., membranous, opaque, base subacute, secondary nerves raised tertiary obscure; petiole 1–2 in. *Panicle* glabrous or obscurely pubescent; pedicels ½–¾ in. Young *flowers* small, petals expanding, reflexed. *Fruit* (not quite ripe) more than ½ in. exclusive of the conical disc and stout style.—Dr. Maingay's examples are in fragments; the size of the panicle is doubtful, and it is not improbable that some at least of the leaves may have more than 3 leaflets or may be pinnate.

17. GAMBLEA, *C. B. Clarke.*

A tree. *Leaves* digitate, 5–3–1-foliolate; stipules within the petiole. *Umbels* panicled, bracts 0, pedicels continuous. *Flowers* polygamous. *Calyx-margin* minute. *Petals* 5, valvate. *Stamens* 5. *Ovary* 3–5-celled; styles 3–5,

combined nearly half their length. *Fruit* globose, 3–5-celled. *Seed* not compressed; albumen lightly ruminated, nearly as in *Hedera*.

1. **G. ciliata,** *C. B. Clarke*; leaflets oblanceolate or if solitary cordate harshly pilose above margin bristle-ciliate.—Araliad sp. 3, *Herb. Ind. Or. H. f. & T.*

SIKKIM; Tonglo, alt. 10,000 ft., *J. D. H., Gamble*; Jongri, *C. B. Clarke.*

Unarmed, 30 ft. *Leaflets* 6½ by 2¼ in., acuminate, hairs on both surfaces harsh in age. or nearly glabrous beneath; petiolules 0–¼ in., densely rusty villose. *Umbels* in small panicles; pedicels ½–¾ in., puberulo-pubescent. *Fruit* ¼ in. diam., ultimately glabrous.

18. TUPIDANTHUS, *H. f. & T.*

A glabrous small tree at first erect, afterwards a lofty climber. *Leaves* digitate; leaflets glabrous, leathery, entire; stipules connate within the petiole. *Umbels* in a compound umbel or small panicle; pedicels thick, not jointed under the flowers. *Calyx-margin* obsolete. *Petals* closely connate, falling off in a cap. *Stamens* very many, in two or several series. *Ovary* cells very numerous; stigmas very many (90), sessile, radiating, contiguous but not connate. *Fruit* globose, depressed (not seen ripe).

1. **T. calyptratus,** *H. f. & T. in Bot. Mag.* t. 4908; *Seem. Rev. Heder.* 6.

KHASIA MTS., alt. 2000–3000 ft.; Borpani, *H. f. & T.* EAST BENGAL; *Griffith* (Kew Distrib. No. 2701).

Leaflets 7–9, 7 by 2½ in., narrowly oblong, shortly acuminate, narrowed at the base; petiolule 2 in. Main *umbel* about 3-rayed, branches 3 in., very stout with large ovate sheathing leathery persistent bracts at their base; partial umbels 5–7-fid; pedicels 1–1¼ in., glabrous, stout. *Buds* ⅝ in. diam., nearly globose; calyx-tube leathery, smooth. *Stamens* about 50–70, densely packed; filaments and anthers as in most of the order but larger. Unripe *fruit* more than ¾ by 1 in., will be berried. *Seeds* numerous, 20–30 at least.

ORDER LXXII. CORNACEÆ. (C. B. Clarke.)

Shrubs or trees. *Leaves* opposite or alternate, generally petioled, entire or occasionally angular lobed or serrate, frequently unequal at the base; stipules 0. *Flowers* usually small, regular, hermaphrodite or unisexual, in axillary or terminal cymes panicles or heads. *Calyx-tube* adnate to the ovary; limb truncate or 4–5-toothed, persistent. *Petals* 0 or 4–5 (occasionally indefinite), epigynous, imbricate or valvate. *Stamens* inserted with the petals and equal to them in number, rarely twice or thrice as many. *Ovary* inferior, 1–4-celled, crowned by a usually fleshy sometimes inconspicuous disc; style single, short or long, stigma capitate or branched; ovule solitary (very seldom 2–3), pendulous from the apex of the cell. *Fruit* generally succulent, 1–4-celled, less often with 2 pyrenes. *Seed* oblong, pendulous, albumen copious, fleshy; embryo minute or cotyledons flat leafy nearly as wide as the seed.—DISTRIB. Species 75, chiefly in the northern hemisphere.

* Flowers hermaphrodite.

† ***Petals narrow much elongate.***

Stamens twice or thrice the petals. Cotyledons crumpled . . . 1. ALANGIUM.
Stamens equalling the petals in number. Cotyledons flat . . . 2. MARLEA.

†† *Petals short or oblong.*

Ovary 2-celled . . . . 3. CORNUS.
Ovary 1-celled . . . . 4. MASTIXIA.

** Flowers unisexual.

† *Leaves opposite.*

Petals 4. Stamens 4 . . . . 5. AUCUBA.

†† *Leaves alternate.*

Ovary 1-celled. Flowers in dense heads . . . . 6. NYSSA.
Ovary 4-celled. Flowers in large panicles . . . . 7. TORICELLIA.

1. ALANGIUM, *Lamk.*

Shrubs or small trees, armed or not. *Leaves* alternate, petioled, oblong, entire, 3-nerved at the base, persistent. *Flowers* in axillary fascicles or condensed cymes, hermaphrodite, silky, white, jointed on the pedicel; bracts 0. *Calyx-tube* adnate to the ovary, limb 5–10-toothed or truncate. *Petals* 5–10, linear-oblong, valvate, then reflexed. *Stamens* twice as many as the petals or more, filaments hairy; anthers very long. *Ovary* inferior, 1-celled, surmounted by a disc; style very long, stigma large, capitate; ovule pendulous. *Fruit* a berry, crowned by the somewhat enlarged calyx-limb. *Seed* oblong, albumen ruminated; cotyledons leafy, crumpled; radicle elongate.—DISTRIB. Species 2; tropical and subtropical Asia and Africa.

The species with stamens equal in number to the petals in which the structure of the embryo is unknown are here for convenience placed under *Marlea*; Sir J. Hooker (*Gen. Pl.* i. 949) has placed them in *Alangium*, but till the embryo is known their position must be uncertain.

1. **A. Lamarckii,** *Thwaites Enum.* 133; calyx-tube in the bud not furrowed, fruit ellipsoid quite smooth with slight vertical ribs when dry. *Dalz. & Gibs. Bomb. Fl.* 109; *Brand. For. Fl.* 250. A. decapetalum, *Lamk. Dict.* i. 174; *DC. Prodr.* iii. 203; *Wall. Cat.* 6884; *W. & A. Prodr.* 325; *Wight Ic.* t. 194; *Miq. Fl. Ind. Bat.* i. pt. i. 774; *Kurz For. Fl.* i. 543. A. hexapetalum, *Lamk. & DC. llc.*; *Roxb. Hort. Beng.* 38, *Fl. Ind.* ii. 502; *Wall. Cat.* 6883; *W. & A. Prodr.* 326; *Wight Ill.* t. 96. A. tomentosum, *Lamk. & DC. ll. c.*; *Wall. Cat.* 6885. A. sundanum, *Kurz l. c.* A. latifolium, *Miq. in Pl. Hohenack.* No. 719.—*Rheede Hort. Mal.* iv tt. 17, 26.

Throughout India from the N.W. HIMALAYA to CEYLON and TENASSERIM; very common.—DISTRIB. Malaya and South China to the Philippines. East Africa.

A small tree or rambling shrub, armed or not. *Leaves* 3–6 by 1–2 in., oblong (*A. decapetalum*), or elliptic (*A. hexapetalum*), acute or subobtuse, the base unequal somewhat rounded, above nearly glabrous with pubescent nerves, beneath with more or less scattered hair and often with tufts of hairs or hollow glands in the axils of the primary nerves; petiole $\frac{1}{4}$ in., hairy, often villous or woolly. *Flowers* in small close fascicles; peduncles pedicels and calyx-tube usually woolly. *Calyx-limb* minutely toothed. *Petals* 5–10 usually 6–7, $\frac{1}{2}$–$1\frac{1}{4}$ in. woolly without. *Stamens* about 20–30. *Style* glabrous, uniformly cylindric, stigma large subglobose. *Fruit* $\frac{5}{8}$ by $\frac{3}{8}$ in., black, closely pubescent or finally glabrous; endocarp bony.—The examples of *A. sundanum*

communicated by Miquel to the British Museum agree with Mr. Kurz's, which have the calyx-tube not furrowed, and do not materially differ from *A. Lamarckii,* but the examples of *A. sundanum* at Kew have the calyx-tube (even in the bud) deeply grooved and appear a distinct species.

VAR. *glandulosum,* Thwaites Enum. 133 (sp.); young parts ruddy-furfuraceous, leaves ovate or oblong rostrate-acuminate, beneath with most minute shining glands and with glandular pores at the axils of the primary nerves, flowers glandular sparingly hairy, pedicels and calyces furfuraceous with red glands.—Ceylon, Central Province, alt. 2000–4000 ft.; *Thwaites.*—According to Mr. Thwaites a closely allied but distinct species. The peduncles, calyx-tube, and petals are much less woolly than in *A. Lamarckii*; these and the tender surfaces of the leaves are not (in Thwaites' No. 381) glandular, but covered with most minute glistening hairs, giving under a common lens a glandular appearance. *A. glandulosum* thus has much shorter hairs than the ordinary forms of *A. Lamarckii,* while some examples of *A. Lamarckii* have the under surface of the leaves glabrous or very nearly so.

2. **MARLEA,** *Roxb.*

Trees or shrubs. *Leaves* alternate, petioled, orbicular or oblong from an oblique base. *Flowers* in axillary contracted cymes, white, jointed on the pedicel, hermaphrodite. *Calyx-tube* adnate to the ovary, limb toothed or truncate. *Petals* 4–8, linear, free or slightly cohering at the base, valvate. *Stamens* 4–8, filaments attached to the petals slightly at the base and there usually hairy; anthers linear. *Ovary* 1–3-celled or 1-celled at the apex 2–3-celled at the base, crowned by a disc; style long, often thicker upwards and pubescent, stigma simple or lobes 4 linear or sub-clavate; ovule solitary in each complete or incomplete cell. *Berry* 1–2-celled, 1–2-seeded. *Seed* (in *M. begoniæfolia* and *ebenacea*) oblong, compressed; cotyledons orbicular, thin, leafy; radicle short —DISTRIB. Species 8; India, to Japan, Malaya, Australia, and Polynesia.

SECT. I. **Pseudalangium,** F. Muell. *Ovule* 1. *Embryo* of Marlea. (RHYTIDANDRA, *A. Gray.*)

1. **M. Griffithii,** *C. B. Clarke*; leaves oblong acuminate, cymes repeatedly divided, flowers numerous and close, style glabrous, stigma simple subglobose.

MALACCA; *Griffith* (No. 3387 Kew Distrib.); *Maingay* No. 708.

A tree (*Maingay*); branchlets minutely rusty-pubescent. *Leaves* $5\frac{1}{4}$ by $1\frac{3}{4}$ in., very unequal auricled at the base, nearly glabrous or minutely pubescent on the nerves above, beneath with spreading fulvous hairs on the main nerves and the surface minutely dotted and with more or less scattered villous hairs; petiole $\frac{1}{5}$ in., fulvous, villous. *Cyme* with minute close fulvous pubescence rather longer and softer on the calyx-tube; bracteoles most minute, linear, deciduous. *Calyx-tube* not furrowed, limb almost truncate. *Petals* 5, $\frac{1}{3}$ in., nearly glabrous. *Stamens* 5, filaments short with much wool at their summit. *Ovule* 1.

2. **M. ebenacea,** *C. B. Clarke*; leaves oblong acuminate, cymes few-flowered, style hairy, stigma lanceolate grooved. Alangium ebenaceum, *Griff. in Herb.*

MALACCA; *Griffith* (No. 3383 Kew Distrib.); *Maingay* No. 706.

Branches stout, glabrous or nearly so. *Leaves* 10 by $3\frac{1}{4}$ in., glabrous, entire, thick and somewhat coriaceous, base subacute slightly unequal; petiole $\frac{3}{8}$–$\frac{1}{2}$ in. thick. *Cyme* short, 4–8-flowered, minutely fulvous-pubescent. *Calyx-tube* more softly pubescent, not grooved, limb much dilated, truncate. *Petals* $\frac{3}{4}$–1 in., 6 (sometimes 5),

with minute close tomentum. *Stamens* 6 or 5, filaments short, woolly. *Style* shortly hairy, stigma an elongate quadrangular pyramid; ovule 1. *Fruit* $\frac{7}{8}$ by $\frac{1}{2}$–$\frac{5}{8}$ in., nearly glabrous and without ribs, crowned by the short cylindric truncate little-enlarged limb of the calyx. *Seed* much compressed, albumen fleshy; cotyledons orbicular, thin, flat.

3. **M. nobilis,** *C. B. Clarke*; leaves elliptic or orbicular, cymes few-flowered, calyx-tube in the bud deeply grooved.

MALACCA; *Griffith* (Kew Distrib. Nos. 3384, 3385); *Maingay* No. 707. SINGAPORE, *Maingay* No. 705.

Branchlets petioles cymes and leaves beneath densely fulvous-villous. *Leaves* often 8 by 5½ in. (sometimes only half these dimensions), not acuminate, from cordate to subacute at the base, firm, at length glabrous above; petiole often $\frac{3}{4}$ in. *Cyme* short, 4–8-flowered. *Calyx-tube* deeply grooved, teeth prominent rising from the angles. *Petals* 6–5, $\frac{3}{4}$ in., much dilated at the base, very villous. *Stamens* 6–5; filaments short woolly. *Style* cylindric densely villous, the very apex narrowed, stigma as in *M. ebenacea*; ovule 1. *Fruit* 1 by $\frac{5}{8}$ in., ellipsoid, compressed, very woolly, with 10 or 12 light vertical ridges, crowned by the incurved calyx-teeth.

4. **M. barbata,** *R. Br. in Wall. Cat.* 7129; shaggy with much soft spreading hair, leaves elliptic or ovate acuminate, cymes many-flowered, style glabrous apex almost divided into two subclavate stigmas.

BHOTAN and ASSAM; *Griffith* (Kew Distrib. No. 3388). KHASIA MTS.; *Wallich.*

Leaves 4 by 2½ in., entire, rounded or subcordate at the base, with scattered golden or brownish hairs on both surfaces especially beneath; petiole $\frac{1}{2}$–$\frac{3}{4}$ in., densely hairy. *Cyme* 12–30-flowered with spreading golden hairs. *Calyx-tube* shaggy, not grooved, teeth lanceolate. *Petals* 6–5, $\frac{1}{3}$–$\frac{1}{2}$ in., hairy on the back. *Filaments* short, hairy. *Ovule* 1. *Fruit* $\frac{1}{3}$ by $\frac{1}{5}$ in., ovoid, finally glabrous, slightly striated longitudinally, crowned by the erect calyx-teeth.

SECT. II. **Eu-Marlea.** *Ovules* 2, rarely 1 or 3. *Fruit* normally 2-seeded.

5. **M. begoniæfolia,** *Roxb. Cor. Pl.* t. 283, *Hort. Beng.* 28, *Fl. Ind.* ii. 261; young leaves and innovations villous, mature leaves more glabrous broad angular lobed or entire, connective hairy or nearly glabrous, style glabrous or with scattered hairs. *DC. Prodr.* iv. 267; *Bot. Reg.* 1838, t. 61; *Wall. Cat.* 3719; *Miq. Fl. Ind. Bat.* i. pt. i. 744; *Brand. For. Fl.* 251; *Kurz For. Fl.* i. 544. M. affinis, *Dcne. in Jacq. Voy. Bot.* t. 83. M. tomentosa, *Endl. ex Hassk. in Flora* 1844, p. 605; *Miq. l. c.* 775; *Kurz l. c.* 545. Diacicarpium tomentosum, *Blume Bijd.* 657; *Hassk. in Bonpland.* vii. 173. D. rotundifolium, *Hassk. l. c.* 172. Stylidium chinense, *Lour. Fl. Cochinch.* 221. Styrax javanicum, *Blume Bijd.* 671 (ex Kurz).

Throughout Northern India, alt. 1000–6000 ft., common from the PUNJAB to BENGAL and BURMA.—DISTRIB. China, Japan.

A tree, often small, but attains 60 ft.; branches horizontal. *Leaves* 4½ by 3¼ in., sometimes very large, from orbicular to broad oblong, acuminate, base rounded or subcordate unequal, not serrate nor denticulate, above glabrous when mature or villous on the nerves rarely with scattered fulvous hairs on the surface also, mature usually glabrous beneath with or without tufts of hairs in the axils of the main nerves, which are puberulous, or closely hairy on the nerves; petiole 1–1¼ in., fulvous-hairy or glabrous. *Cymes* 1–3 in., dichotomous, 8–12-flowered, more or less fulvous-hairy; bracts inconspicuous. *Calyx-tube* not grooved; limb shortly toothed. *Petals* usually 6–8, slightly hairy. *Filaments* short, hairy. *Style* usually glabrous, stigma capitate, sub-2-4-lobed. *Fruit* $\frac{1}{3}$ by $\frac{1}{4}$ in., ovoid, glabrous, obscurely ribbed, crowned with the very

narrow calyx-limb.—The Japan *M. macrophylla* and *M. heterophylla* hardly differ from this.

VAR. *alpina*; leaves not angular, hairy all over beneath and no tufts in the nerve-axils.—Sikkim, alt. 6000-9000 ft.; *H.f. & T.* Marlea sp. 2.

3. CORNUS, *Linn.*

Trees and shrubs, glabrous or hairy, hairs often centrally attached. *Leaves* opposite or alternate, petioled, entire. *Flowers* small, hermaphrodite, white or yellow, in branched cymes or in involucrate heads. *Calyx-tube* campanulate or urn-shaped; limb with 4 short or long teeth. *Petals* 4, oblong, valvate. *Stamens* 4, anthers oblong. *Ovary* 2- (very rarely 3-) celled; style filiform or cylindric, stigma capitate sub-2-lobed; ovule solitary pendulous in each cell. *Drupe* ovoid, 2-celled, 2-seeded; endocarp bony. *Seeds* oblong, compressed, albumen fleshy; cotyledons leafy.—DISTRIB. Species 15, in N. temperate regions, and 2 in Burma and Hongkong.

SECT. I. **Thelycrania,** *Endl.* *Flowers* cymose, without bracts.

1. **C. sanguinea,** *Linn.*; *Boiss. Fl. Orient.* ii. 1092; a shrub, leaves opposite rarely exceeding 3 in. shortly or not at all acuminate not very glaucous beneath. *DC. Prodr.* iv. 272; *Brand. For. Fl.* 253. C. australis, *C. A. Mey.*; *Boiss. l. c.*

KASHMIR; alt. 7000 ft.; Gulmurg, *Stewart.*—DISTRIB. W. and N. Asia, Europe.

An erect shrub, branchlets leaves beneath and cymes with minute white hairs. *Leaves* (in Kashmir examples) 1½ by 1¼ in., ovate from a rounded base, obtuse, beneath paler and with appressed hairs, nerves 4 on each side with spreading crisped hairs beneath; petiole nearly ¼ in. *Fruit* ⅕ in. diam., subglobose, minutely hairy.

2. **C. macrophylla,** *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* i. 433; a tree, leaves opposite or alternate usually exceeding 3 in. distinctly acuminate glaucous beneath. *Don Prodr.* 141; *Wall. Cat.* 469; *DC. Prodr.* iv. 272; *Brand. For. Fl.* 252, t. 32. C. brachypoda, *C. A. Mey.*; *Walp. Ann.* ii. 725.

Throughout the HIMALAYA, alt. 4000–8000 ft., frequent.—DISTRIB. China, Japan.

An erect tree 40 ft., branches horizontal. *Leaves* 6 by 3¼ in. (often much larger), ovate; base rounded or subacute; secondary nerves 6 on each side, ultimately glabrous above, beneath with scattered minute appressed hairs; petiole 1 in. *Panicles* terminal, erect, often 4–5 in. diam., branches opposite or alternate. *Calyx-tube* urn-shaped, whitish from the numerous appressed hairs. *Fruit* ⅛–⅕ in. diam., globose.—*C. alternifolia*, Linn. f., a N. American species differs very little, if at all, from this.

VAR. *Stracheyi*; panicle densely clothed with spreading fulvous hairs, young leaves silky hairy.—Kumaon, alt. 7000 ft., Kathi; *Strachey & Winterbottom.*

3. **C. oblonga,** *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* i. 432; leaves narrowly oblong narrowed at both ends adult glabrous or minutely hairy beneath. *Don Prodr.* 140; *Wall. Cat.* 468; *DC. Prodr.* v. 272; *Brand. For Fl.* 253; *Kurz For. Fl.* i. 545.

From the JHELUM to NIPAL, alt. 4000–7000 ft.; frequent. BHOTAN *Griffith* KHASIA MTS., alt. 4500 ft.; *C. B. Clarke.* MARTABAN HILLS; alt. 4000–7000 ft. *Kurz.*

A tree 20–30 ft. *Leaves* 5 by 1¼ in., somewhat coriaceous, nerves much elevated beneath; petiole ¼ in. *Pedicels* and cyme-branches minutely pubescent; bracteoles small. *Calyx*-tube campanulate, hardly urn-shaped. *Petals* almost glabrous. *Fruit* ⅓ by ⅙ in., ellipsoid, glabrous or nearly so.

Var. *Griffithii*; leaves beneath with spreading hairs.—Bhotan; *Griffith*, No. 2091.

Sect. II. **Benthamia,** Lindl. (gen.) *Flowers* connate in dense heads subtended by 4 large white bracts.

4. **C. capitata,** *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* i. 434; leaves oblong or elliptic adult closely covered above with minute hairs, calyx-teeth distinct reflexed. *Don Prodr.* 141; *Wall. Cat.* 467, *Pl. As. Rar.* t. 214; *Brand. For. Fl.* 253. Benthamia fragifera, *Lindl. in Bot. Reg.* t. 1579; *Wight Ill.* t. 122.

From Kulu and Kumaon to Bhotan, alt. 4000–7000 ft., not rare.

A small tree, the tender parts densely clothed with minute bicuspidate hairs. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ in., narrowed at both ends, hardly acuminate. *Heads* hemispherical, $\frac{3}{8}$–$\frac{1}{2}$ in. wide; bracts 1 by $\frac{5}{8}$ in. *Fruiting* heads depressed, globose, 1 in. wide, succulent, of numerous coalesced pericarps; endocarp about $\frac{1}{4}$ in., bony, ellipsoid or obovoid, compressed; calyces spreading on all sides from the young fruit heads, ultimately deciduous.

Var. *khasiana*; adult leaves glabrous or very nearly so.—Khasia, alt. 5000–6000 ft., Kalapani; *H. f. & T.* This variety approaches *C. japonica, Thunb.* which is closely allied but has the calyx-limb subtruncate.

4. MASTIXIA, *Blume.*

Trees, young parts more or less pubescent. *Leaves* alternate or opposite, petioled, entire. *Flowers* hermaphrodite, 2-bracteolate, small, in terminal many-flowered panicles; bracts small or lengthened, pedicels short or 0, jointed under the flower. *Calyx-tube* campanulate, pubescent or silky; limb 5–4-toothed. *Petals* 5–4, ovate, leathery, valvate, silky. *Stamens* 5–4; anthers cordate-oblong. *Ovary* 1-celled; disc fleshy; style cylindric, simple; ovule 1, pendulous from one side of the cell very near its summit. *Drupe* ellipsoid or ovoid, crowned by the calyx-teeth or a scar; putamen grooved down one face; endocarp protruded inwards down one side. *Seed* ellipsoid; albumen fleshy; embryo small, radicle elongate, cotyledons thin, elliptic.—Distrib. Species 8; S. India and Malaya.

* Leaves all alternate.

† *Bracts about $\frac{1}{8}$ in., acute.*

1. **M. tetrandra,** *C. B. Clarke*; bracts caducous, calyx-teeth in the bud shortly triangular, stamens usually 4. Bursinopetalum tetrandrum, *Wight ms.*; *Thwaites Enum.* 42.

Ceylon; *Thwaites.*

A large tree, foliage heavy green. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ in., elliptic or obovate-oblong, suddenly obtusely acuminate, narrowed at the base, glabrous, drying green; petiole $\frac{1}{2}$–$\frac{3}{4}$ in., minutely pubescent when young. *Panicle* 2–3 in. diam., branches and calyx-tube with close fulvous pubescence. *Calyx-teeth* rarely 5. *Style* $\frac{1}{16}$ in. *Fruit* 1 by $\frac{3}{8}$ in., almost cylindric, or $\frac{3}{4}$ by $\frac{1}{2}$ in. ellipsoid.

Var. *Thwaitesii*; leaves $1\frac{3}{4}$ by $\frac{1}{2}$–$\frac{3}{4}$ in. obtuse turning black in drying, panicle and petals glabrous.—Ceylon; *Thwaites.* Very different in general appearance from *M. tetrandra*, but Mr. Thwaites regards it as a variety.

2. **M. arborea,** *C. B. Clarke*; bracts acute persistent till after the petals drop, calyx-teeth in the bud triangular-lanceolate, stamens 5. Bursino-

petalum arboreum, *Wight Ic.* t. 956; *Thwaites Enum.* 42; *Bedd. Fl. Sylv.* t. 216.

CACHAR; Calacherra, *R. L. Keenan.* NILGHIRI MTS.; near Sisparah, *Wight.* CEYLON; alt. 4000–7000 ft., *Gardner, Thwaites.*

A large tree, foliage dark green. *Leaves* 3 by 2 in., elliptic or obovate-oblong, suddenly shortly acuminate, narrowed at the base, glabrous, drying black; petiole ½–1 in., minutely pubescent when young. *Panicle* 2–3 in. diam., branches and calyx-tube with close fulvous pubescence. *Style* less than $\frac{1}{16}$ in. *Fruit* 1⅛ by ½–⅝ in., ellipsoid.—Closely allied to the preceding. Possibly not distinct from *M. pentandra,* Blume Mus. Bot. i. 256, of which there is no authentic example at Kew; the description agrees except that the leaves are much larger, 4–8 in.

†† *Some of the bracts ½–¾ in., linear-oblong, obtuse.*

3. **M. pentandra,** *Blume Mus. Bot.* i. 256; leaves 4–7 in., bracteoles and calyx-tube very hairy, calyx-teeth 5 ovate subacute. M. cuspidata, *Blume l. c., ex Miq. Fl. Ind. Bat.* i. pt. i. 1095.

MALABAR; Canara, Dharwar and Bellary; *Law*; Concan; *Stocks.*

A tree. *Leaves* 4–7 by 1¾–2¼ in., oblong or elliptic, narrowed to each end, puberulous on both surfaces at least when young, drying green, whiter beneath; petiole ¾–1½ in., pubescent when young. *Panicle* 3–6 in. diam., very pubescent towards the extremities. Some of the lower *bracts* 1¼ in., leaflike though narrow, many of the upper exceeding ¼ in. *Buds* silky. *Style* less than $\frac{1}{16}$ in. *Fruit* 1¼ by ⅗ in., elongate-ellipsoid.—Identified from description only: Blume does not mention the large bracts, so that this is possibly a new species.

4. **M. bracteata,** *C. B. Clarke*; leaves 2 in., bracteoles and calyx-tube minutely silky or almost glabrous, calyx-teeth 5 short triangular.

MALACCA; *Maingay,* No. 710.

Branchlets glabrous. *Leaves* 2–3 by 1–1½ in., elliptic, suddenly and obtusely acuminate, narrowed at the base, glabrous, drying an olive green; petiole ¼ in. *Panicle* 2 in. diam., nearly glabrous. Some of the lower *bracts* nearly 1 in., leaflike though narrow, many of the upper nearly ¼ in. and obtuse. *Buds* silky. *Style* less than $\frac{1}{16}$ in. *Fruit* not seen.

** Leaves subopposite and opposite.

5. **M. Junghuhniana,** *Miq. Fl. Ind. Bat.* i. pt. i. 772; leaves glabrous beneath or shortly hairy on the main nerves, calyx-teeth 4 roundish minutely pubescent.

MALACCA; *Maingay* No. 709.

A tree of moderate size; tips of branchlets pubescent. *Leaves* 4½ by 2 in., oblong, narrowed to both ends, drying a shining green above, much whiter beneath; petiole ½ in., pubescent when young. *Panicle* 2–3 in. diam., trichotomous; bracteoles ⅛–⅓ in., pubescent. Young *petals* most minutely silky. *Fruit* not seen.—Identified with *M. Junghuhniana* by the description, which closely agrees. It has been named *M. trichotoma,* Blume, in the Kew Herbarium, of which species it is very possibly a variety.

6. **M. Maingayi,** *C. B. Clarke*; under surface of the leaves and panicle densely softly woolly.

SINGAPORE; *Maingay* No. 711.

Branchlets densely woolly. *Leaves* 5 by 2¾ in., elliptic, acute not acuminate, narrowed at the base, shining green above, with much spreading soft hair and rugose beneath; petiole 1 in. *Panicle* 4 in. diam.; branches thick; bracts ⅛ in., ovate, obtuse, thick. Young *flowers* densely woolly. *Fruit* 1¼ by ⅝ in., ovoid, much narrower upwards.—A very fine and distinct species.

5. **AUCUBA,** *Thunb.*

Glabrous branching shrubs. *Leaves* opposite, petioled, ovate or lanceolate, obtusely serrate, leathery, shining, turning black in drying. *Flowers* small, diœcious, in pseudo-axillary panicles, lurid purple; bracts inconspicuous; pedicels jointed and 2-bracteolate. MALE: calyx small, 4-toothed; petals ovate or lanceolate, valvate; stamens 4; disc quadrangular, fleshy; no rudiment of an ovary. FEMALE: calyx-tube ovoid, limb 4-toothed; petals as in the male; no rudiments of stamens; ovary 1-celled, disc fleshy; style short, thick, stigma capitate; ovule solitary, pendulous. *Berry* ellipsoid, crowned by the calyx-teeth and style. *Seed* oblong, albumen copious; embryo minute, radicle superior near the summit of the seed.—DISTRIB. Species 3 or 1, Sikkim, Hongkong, Japan.

1. **A. himalaica,** *Hook. f. Ill. Him. Pl.* t. 12; leaves lanceolate or narrowly lanceolàte acuminate, branches of the panicle very pilose.

SIKKIM and BHOTAN, alt. 6000–9000 ft., *Griffith*, &c.—DISTRIB. Japan.

A stout shrub, 6–12 ft., branching dichotomously. *Leaves* 8 by 1¾ in., narrowed at the base, denticulate or serrate; petiole ¾–1 in. *Panicles* ¾ in. diam., terminal on very short lateral branches. *Fruit* ½ by ¼ in., smooth, shining, variable in colour, orange yellow or scarlet.—Yokohama specimens, named *A. longifolia* in Herb. Hook., are identical with the Indian. *A. japonica* differs by having rather broader less acuminate leaves and less hairy panicles. The increase of material renders more probable the suggestion made by Sir J. Hooker *l. c.* that there is but one and that a very variable species of *Aucuba.*

6. **NYSSA,** *Linn.*

Trees (or shrubs), innovations silky. *Leaves* alternate, petioled, entire. *Flowers* capitate, on axillary peduncles, polygamo-diœcious, 1 or few females and many males in a head, each 3–4-bracteolate, or the males irregularly coalescing. MALE: calyx short, cup-shaped, 5–7-toothed; petals 5–7, imbricate, hairy; stamens usually 10 (in the Indian species) around a large circular disc; rudiment of the ovary 0 or small. FEMALE: calyx-tube campanulate; limb 5-toothed; petals 0 or minute; no rudiments of stamens; ovary 1-celled; style cylindric, simple or shortly 2-fid; ovule solitary, pendulous. *Berry* oblong or ovoid. *Albumen* copious; cotyledons flat, leafy, nearly as broad as the seed. —DISTRIB. Species 5–6, in N. America, and from Sikkim to Java.

1. **N. sessiliflora,** *Hook f. in Gen. Pl.* i. 952; leaves oblong acuminate, flowers sessile. Daphniphyllopsis capitata, *Kurz For. Fl.* i. 240; *and in Journ. As. Soc.* 1875, part ii. 201, *with fig.* Ilex daphnephylloides, *Kurz in Journ. As. Soc.* 1870, pt. ii. 72. Agathisanthes javanica, *Blume Bijd.* 645; *Miq. Fl. Ind. Bat.* i. pt. i. 839. Ceratostachys arborea, *Blume Bijd.* 644; *Miq. l. c.*

SIKKIM, alt. 5000–8000 ft.; *J. D. H., Kurz.* KHASIA MTS.: *H. f. & T.* CACHAR; *R. L. Keenan.* MARTABAN, alt. 5000–7000 ft.; *Kurz.*—DISTRIB. Java.

A tree, 60 ft. *Leaves* 6 by 2 in., acute at the base, punctate on both surfaces, adult glabrous beneath, rarely pubescent and chiefly on the nerves; petiole 1 in. *Peduncles* 1–1¼ in., more or less pubescent. *Calyx-teeth* rounded, pubescent and ciliate. Ripe *fruit* ½ by ⅓ in., ovoid, narrowed upwards to a point, glabrous.

7. **TORICELLIA,** *DC.*

A small tree, branches thick. *Leaves* alternate, long-petioled, deciduous, broadly cordate, acute, sharply serrate; petiole sheathing at base. *Flowers* small, white, diœcious, numerous in pendulous panicles; pedicels short, bracteolate, in the female jointed under the flower, in the male not. MALE: calyx-tube short, lobes generally 5; petals 5, oblong, acuminate, induplicate-valvate; stamens usually 5; disc flat; rudiment of ovary 0 or of 1–3 small bristles. FEMALE; calyx-tube ovoid; limb minute, 3–5-toothed; petals and stamens 0; ovary 3–5-celled, disc inconspicuous; style very short, stigmas 3–5, cylindric; ovule solitary pendulous in each cell. *Drupe* small, purple, obliquely ovoid, crowned by the stigmas, 4-celled, 1-seeded. *Seed* linear, curved; albumen fleshy; embryo minute.

1. **T. tiliæfolia,** *DC. Prodr.* iv. 257; *Seem. Journ. Bot.* iii. 361, t. 41. Sambucus tiliæfolia, *Wall. Cat.* 483.

NIPAL; *Wallich.* SIKKIM, alt. 6000 ft., *J. D. H.* BHOTAN; *Griffith.*

Leaves 6 in. diam., adult glabrous or slightly pubescent on the nerves beneath, membranous, palmately nerved from the base; petiole often 3–4 in. Male *panicle* 1 ft., very compound, minutely pubescent or glabrous, with a few scattered linear bracts $\frac{1}{4}$ in.: fem. sometimes nearly as long as the male, but much less dense and with far fewer more scattered flowers. *Fruit* $\frac{1}{5}$ in., ovoid, glabrous.

INDEX OF GENERA, SPECIES AND SYNONYMS.

The Synonyms and Species incidentally mentioned are printed in Italics.

	Page
ABRUS, LINN	175
acutifolius, Blume	175
fruticulosus, *Wall.*	176
lævigatus, E. Meyer	175
melanospermus, Hassk.	175
minor, Desv.	175
pauciflorus, Desv.	175
precatorius, *Linn.*	175
pulchellus, *Wall.*	175
Acacia, *Willd.*	292
alba, Willd.	294
alliacea, Ham.	297
amara, Willd.	301
amblycarpa, Grah.	298
arabica, *Willd.*	293
Arar, Ham.	297
arcuata, Decaisne	294
arrophula, *Don.*	298
biceps, DC.	290
cæsia, *W. & A.*	297
cæsia, Wall.	298
Campbellii, Arn.	293
canescens, *Grah.*	298
Caringa, Ham.	290
Catechu, *Willd.*	295
Catechu, W. & A.	294
Catechu, Brand.	295
catechuoides, Wall.	295
chrysocoma, Miq.	294
chundra, Willd.	295
cinerea, Spreng.	288
concinna, *DC.*	296
concinna, Wall.	298
Dalea, Desf.	288
dealbata, Link.	292
densa, Wall.	294
dumosa, W. & A.	296
eburnea, *Willd.*	293
elata, Grah.	299
Farnesiana, *Willd.*	292
Farnesiana, Wall.	293
ferruginea, *DC.*	295
foliolosa, Grah.	301
frondosa, Willd.	290
glauca, DC.	290
Hooperiana, Zippel	296
indica, Desv.	292
Intsia, *Willd.*	297
intsioides, DC.	297
Jacquemontei, *Bth.*	293
Julibrissin, Willd.	300
Latronum, *Willd.*	296
Lebbek, Willd.	298
lenticularis, *Ham.*	296
leucocephala, DC.	290
leucophlæa, *Willd.*	294
megaladena, Desv.	297
melanoxylon, R. Br.	292
microcephala, *Gr.*	294
modesta, *Wall.*	296
mollis, Wall.	300
myriophylla, Grah.	301
Nemu, Willd.	300
nitida, Willd.	303
odoratissima, Willd.	299
oxyphylla, *Grah.*	297
paludosa, Miq.	297
pennata, *Willd.*	297
pinnata, D. & G.	297
planifrons, *W. & A.*	293
pluricapitata, *Steud.*	298
polyacantha, Willd.	295
polycephala, Grah.	298
prensans, Lowe	297
procera, Willd.	299
pseudo-intsia, Miq.	297
Roxburghii, W. & A.	293
rugata, *Ham.*	297
rupestris, Stocks	295
Senegal, *Willd.*	295
Sirissa, Ham.	298
stipulata, DC.	300
Suma, *Kurz*	294
Sundra, *DC.*	295
Sundra, Wall.	294
tomentella, Zipp.	298
tomentosa, *Willd.*	294
umbraculata, Wall.	296
vera, Willd.	293
Verek, Guill. & Pers.	295
Wallichiana, DC.	295
Wightii, *Baker*	298
ACACIEÆ	61
Acanthopanax, *Dcne & Planch.*	726
aculeatum, *Seem.*	726
sepium, Seem.	726
Acmena parviflora, DC.	485
zeylanica, Thwaites	485
Acrocarpus, *W. & A.*	292
combretiflorus, Teysm. & Binnen	292
fraxinifolius, *Wight*	292
Acronema, Hf. & T.	686
tenerum, Edgw.	686
Actinostemma, *Griff.*	643
tenerum, *Griff.*	633
Adambea glabra, Lamk.	577
Adamia chinensis, Gardn. & Champ.	406
cyanea, Wall.	406
versicolor, Fortune	406
Adenanthera, *Linn.*	287
aculeata, Roxb.	288
bicolor, *Moon*	287
pavonina, *Linn.*	287
Æchmandra conocarpa, Dalz. & Gibs.	628
deltoidea, Arn.	626
epigæa, Arn.	628
indica, Arn.	626
rostrata, Arn.	627
velutina, D. & G.	628

Page
zeylanica, Thwaites. 629
Æschynomene, *Linn.* . 151
aspera, *Linn.* . . 152
aspera, Wall. . . 151
bispinosa, Jacq. . . 115
cannabina, Retz. . 115
diffusa, Roxb. . . 115
diffusa, Willd. . . 151
grandiflora, Linn. . 115
indica, *Linn.* . . . 151
indica, Burm. . . 114
indica, Hassk. . . 152
indica, Wall. . . . 152
kashmiriana, Camb. 151
procumbens, Roxb. . 115
pumila, Linn. . . 151
Roxburghii, Spreng. 151
Sesban, Linn. . . 114
spinulosa, Roxb. . 115
surattensis, W. & A. 152
trachyloba, Miq. . 152
viscidula, Willd. . 151
Afzelia, *Smith* . . . 274
bijuga, *A. Gray* . 274
? coriacea, *Baker* . 275
palembanica, *Baker* 275
retusa, *Kurz.* . . 274
æsculifolium, Seem. 738
Agalma elatum, Seem. 728
glaucum, Seem. . . 728
Griffithii, Seem. . 728
racemosum, Seem. . 729
rostratum, Seem. . 729
tomentosum, Seem. . 728
Aganope floribunda, Miq. 246
Agasta asiatica, Miers. 507
indica, Miers. . . 507
splendida, Miers. . 507
Agati grandiflora, Dsv. 115
Agathisanthes Javanica Bl. 747
Agelæa, *Soland.* . . 46
vestita, *H. f.* . . . 46
Wallichii, *H. f.* . 47
Agrimonia, *Linn.* . . 361
Eupatorium, *Linn.* . 361
Eupatorium, Thw. . 362
javanica, Miq. . . 361
lanata, Wall. . . 361
nepalensis, Don. . 361
pilosa, *Ledeb.* . . 361
viscidula, Bunge. . 361
zeylanica, *Moon* . . 362
Aizoideæ 658
Aizoon, *Linn.* . . . 659
canariense, *Linn.* . 659
Alangium, *Lamk.* . . 741
decapetalum, Lamk. 741
ebenaceum, Griff. . 742
glandulosum, *Thw.* 742
hexapetalum, Lamk. 741
Lamarckii, *Thw.* . 741
latifolium, Miq. . 741
sundanum, Kurz . 741
tomentosum, Lamk. 741
Albizzia *affinis*, Fourn. 301
amara, *Boivin.* . . 301
glomeriflora, *Kurz* . 300
Julibrissin, *Durazz.* 300
latifolia, Boivin . 298
Lebbek, *Benth.* . . 298
lebekkoides, Benth. . 299
lomatocarpa, *DC.* . 299
lophantha 298
lucida, *Benth.* . . 299
marginata, Ham. . 300
micrantha, Boiv. . 299
myriophylla, *Benth.* 300
nellyrenza (nellarenga) *Grah.* . . 301
odoratissima, *Benth.* 299
pedicellata, *Baker* . 299
procera, *Benth.* . . 299
Smithiana, Wall. . 300
speciosa, Willd. . . 298
stipulata, *Boiv.* . . 300
umbrosa, Benth. . . 302
Wightii, Grah. . . 301
Alchemilla, *Linn.* . . 360
ceylanica, Moon Cat. 361
indica, *Gardn.* . . 361
vulgaris, *Linn.* . . 360
vulgaris, Thwaites . 361
vulgaris, Wight . 361
Aldrovanda, *Linn.* . 425
verticillata, Roxb. . 425
vesiculosa, *Linn.* . 425
Alhagi, *Desv.* . . . 145
mannifera, Desv. . 145
maurorum, *Desv.* . 145
napaulensium, DC. 145
Allomorphia, *Blume.* . 527
exigua, *Blume* . . 527
Griffithii, *H.f.* . . 527
hispida, *Kurz.* . . 527
umbellulata, *H.f.* . 527
Allozygia cernua, Nd. 526
Alsine, Burm. . . . 664
Alsomitra, *Bth. & Hk.f.* 634
clavigera, *H.f.* . . 634
sarcophylla, *H.f.* . 634
Altingia, *Noronha* . . 429
excelsa, *Noronha* . 429
Alysicarpus, *Neck.* . 157
belgaumensis, *Wt* . 160
bupleurifolius, *DC.* 158
bupleurifolius, Roxb. 159
bupleurifolius, Wall. 159
diversifolius, Wall. . 158
glaber, E. Meyer . 159
glumaceus, Wall. . 159
gracilis, Edgew. . 158
hamosus, *Edgew.* . 157
Harnieri, Schweinf. 158
heterophyllus, Bth. . 158
Heyneanus, W. & A. 159
Hochstetteri, A. Rich 159
longifolius, *W. & A.* 159
ludens, Wall. . 158, 159
lupulinus, Stocks. . 159
monilifer, *DC.* . . 157
nummularifolius, DC. 158
obovalis, Edgew. . 159
parviflorus, Dalz. . 172
pilifer, Wall. . . 159
pubescens, *Law* . . 160
quadrangularis, Edg. 159
racemosus, Benth. . 160
rotundifolius, Dalz. 172
rotundifolius, Wt. . 157
Rubibarna, Wall. 157, 158
rugosus, *DC.* . . 159
scariosus, Grah. . 159
spicatus, Royle . . 159
styracifolius, DC. . 159
styracifolius, Wall. 159
tetragonolobus, *Edg.* 159
trifoliatus, Stocks. . 158
vaginalis, *DC.* . . 158
vaginalis, Wall. . 159
varius, *Wall.* . . 159
Wallichii, W. & A. 159
Ameletia floribunda, Wight 567
indica, DC. . . . 566
rotundifolia, D. & G. 567
tenuis, Wight. . . 567
Amerimnum fasciculatum, Hamilt. . . 109
obovatum, Hamilt. . 246
pallidum, *Hamilt.* . 108
secundum, Hamilt. . 247
Amherstia, *Wall.* . . 272
nobilis, *Wall.* . . 272
Amherstieæ . . . 61
Ammanella linearis, Miq. 570
subrotunda, *Wall.* . 571
Ammannieæ . . . 565
Ammannia, *Linn.* . . 566
acutidens, Miq. . . . 566

Page
auriculata, Willd. . 570
baccifera, *Linn.* . . 569
cordata, *W. & A.* . 570
debilis, Ait. . . . 569
densiflora, Miq. . . 569
densiflora, Roth. . 568
dentelloides. *Kurz* . 568
egyptiaca. *Willd.* . 569
elongata, Blume. . 566
fimbriata, *Wight.* . 569
floribunda, *C. B. C.* 567
glauca, Wall. . . 569
hexandra, Wall. . 569
Heyneana, *Wall.* . 569
indica, Lam. . . . 569
lanceolata, *Heyne* . 570
latifolia, Wall. 566, 567
microcarpa, DC. . 571
microcarpa, *Roxb.* . 571
multiflora, *Roxb.* . 570
nana, Roxb. . 566, 568
nana, Wall . . . 569
octandra, *Linn. f.* . 571
pentandra, *Roxb.* . 568
peploides, *Spreng.* . 566
polystachya, Wall. . 566
pygmæa, *Kurz.* . 568
repens, Rottl. . . 566
Ritchiei, *C. B. Clarke* 566
Rotala, *F. Muell.* . 567
rotundifolia, *Ham.* . 566
rubra, Ham. . . . 568
salicifolia, *Monti* . 569
salicifolia, Monti . 570
salicifolia, Thwaites 570
senegalensis, *Lamk.* 570
simpliciuscula, *Kurz* 568
subspicata, Benth. . 567
subspicata, Hb. Hoh. 568
tenuis, *C. B. Clarke* 567
verticillata, Boiss. . 569
verticillata, Lamk. . 569
verticillata, W. & A. 570
vesicatoria, Roxb. . 569
Wallichii, Kurz. . 572
Ammi daucifolium, Wall 693
copticum, Boiss. . 682
AMMINEÆ 665
Amphicarpæa, *Elliott.* 181
Edgeworthii, *Benth.* 181
ferruginea, Benth. . 182
Amygdalus collinus, Wall. 313
communis, Linn. . 313
humilis, Edgw. . . 314
persica, Linn. . . 313

Page
ANACARDIACEÆ . . 7
Anacardium, *Rottb.* . 20
latifolium, Lamk. . 31
occidentale, *Linn.* . 20
officinarum, Gærtn. 31
Anagyris barbata, Grah. 62
indica, Lindl. . . 62
nepalensis, Grah. . 62
Anarthrosyne cordata, Kl. 169
Anauxanopetalum Schwenkii, Teysm. & Binnen . . . 27
Andersonia acuminata, Herb. Rottl. . . 451
altissima, Hb. Madr. 450
lanceolata, Hb. Rottl. 451
Andira Horsfieldii, Lesch. 248
Anerincleistus, *Korth* . 529
Griffithii, *H. f.* . 529
Helferi, *H. f.* . . 529
Anethum Fœniculum, Linn. 695
graveolens, Linn. . 709
Panmorium, Roxb. 695
Sowa, Roxb. . . 709
trifoliatum, Roxb. . 685
Angelica, *Linn.* . . 706
Archangelica, Linn. 707
glauca, *Edgw.* . . 706
Candollii, Wall. . 700
Anictoclea Grahamiana, *Nimmo* . . 657
Anisophyllea, *Br.* . . 441
disticha, *Hook.* . . 442
grandifolia, *G. Henslow* 442
Griffithii, *Oliv.* . . 442
zeylanica, *Benth.* . 442
ANISOPHYLLEÆ . . . 435
Anogeissus, *Wall.* . 450
acuminata, *Wall.* . 450
hirta, Wall. . . . 450
latifolia, *Wall.* . . 450
myrtifolia, Wall. . 451
pendula, *Edgw.* . . 451
phillyreæfolia, *Heurck & Muell.* . . . 451
Anplectrum, *A. Gray* 545
annulatum, *Triana* 546
assamicum, C. B. C. 546
barbatum, Triana . 546
cyanocarpum, Kurz. 545
divaricatum, *Triana* 546
glaucum, *Triana* . 545
pallens, Blume. . 545
parviflorum, Benth. 528

Page
Anstrutheria zeylanica, Gard. 441
Anthriscus, *Hoffm.* . 692
nemorosa, *Spreng.* . 692
Anthyllis cuneata, Dum. 142
Apios, *Mœnch.* . . . 188
carnea, *Benth.* . . 188
Apium, *Linn.* . . . 678
graveolens, *Linn.* . 679
involucratum, Roxb. 682
Apteuxis trinervis, Griff. 551
Arachis fruticosa, Retz. 148
hypogæa 161
Aralia, *Linn.* . . . 721
armata, *Seem.* . . 723
bipinnatifida, *C. B. Clarke* 722
cachemirica, *Dcne.* . 722
cissifolia, *Griff.* . 722
digitata, Roxb. . 729
disperma, Bl. . . 738
foliolosa, Seem. . 723
glomerulata, Bl. . . 737
latifolia, W. & A. . 727
macrophylla, Lindl. 722
malabarica, *Bedd.* . 722
palmata, Lour. . . 736
parasitica, Ham. . 724
Pseudo-ginseng, *Bth.* 721
Thomsonii, *Seem.* . 723
ARALIACEÆ 720
Araliad, H. f. & T. 722, 723, 724, 726, 728, 729, 730, 732, 733, 734, 735, 736 737, 738, 739, 740
Araliadium, Miq. . . 725
pinnatifidum, Miq. . 725
ARALIEÆ 720
Araliopsis andamanica, Kurz. 735
Archangelica. *Hoffm.* 707
decurrens, Ledeb. . 707
officinalis, *Hoff.* . 707
Arcyphyllum, Elliott . 226
Argyrolobium, *Eckl. & Zeyl.* 63
divaricatum, J. & Sp. 63
flaccidum, *J. & Sp.* 63
Kotschyi, Boiss. . 64
ornithipodioides, J. & Sp. 64
roseum, *J. & Sp.* . 64
Aria Kumaonensis, Dcne. 375
lanata, Dcne. . . 375
Arillaria robusta, Kurz. 252
Arthrophyllum, *Blume.* 733

Page
alternifolium, Maingay 734
Blumeanum, Zoll. & Mor. 734
diversifolium, Blume. 733
ellipticum, Blume. 734
javanicum, Blume. . 734
ovalifolium, Jungh. 734
pinnatum, *C. B. C.* 734
pinnatum, Maingay 734
Arthrosprion stipulatum, Hassk. . . 300
Arthrostemma paniculatum, Don. . . 525
Aspalathus cuneata, Don. 142
indicus, *Linn.* . . 94
Astilbe, *Ham.* . . . 389
Aruncus, *L.* . . . 389
chinensis, Maxim. . . 389
japonica, Morr. & Dcne. 389
rivularis, *Ham.* . 389
rubra, *H. f. & T.* . 389
speciosa, Junghuhn . 389
Stoliczkai, Kurz . 389
Thunbergii, Maxim. 389
Astragalus, *Linn.* . . 118
acaulis, *Baker.* . 132
acutiflorus, Benth. . 120
adesmiæfolius, *Benth.* 121
Aitchisoni, *Baker* . 121
alpinus, *Linn.* . . 123
Amherstianus, *Bth.* 119
ammocryptos, Boiss. 122
anfractuosus, Bunge. 136
anomalus, *Bunge.* . 133
arabicus, Ehrhenb. 121
bakuensis, *Bunge.* . 132
bhotanensis, *Baker* 126
bicuspis, *Fisch.* . . 135
biflorus, Linn. . . 66
bracteosus, Kl. . . 125
cæruleus, *Hort. Paris* 137
Candolleanus, *Royle* 132
carinalis, Benth. . 126
cashmiriensis, *Bunge.* 127
chlorostachys, *Lindl.* 128
cicerifolius, *Royle.* . 134
ciliolatus, *Benth.* . 129
coluteocarpus, *Boiss.* 130
concretus, Benth. . 131
confertus, *Benth.* . 123
contortuplicatus, *L.* 122
crassicaulis, Grah. . 117
Daltonianus, Bunge. 134
densiflorus, *K. & K.* 125
Page
distans, *Benth.* . . 128
Donianus, *DC.* . . 119
emodi, *Steud.* . . 130
erpocaulis, Boiss. . 122
Falconeri, *Bunge.* . 120
floridus, *Benth.* . 127
frigidus, *Bunge.* . 130
Gerardianus, Grah. 116
Govanianus, Grah. 128
gracilipes, *Benth.* . 122
Grahamianus, Royle 134
graveolens, *Ham.* . 131
hamosus, *Linn.* . . 122
Hendersoni, Baker . 120
Heydei, *Baker* . . 118
himalayanus, *Kl.* . 126
himalensis, Jacquem. 128
hippocrepidis, Benth. 119
hosackioides, *Benth.* 123
humifusus, Jacquem. 119
hypoglottoides, *Baker* 124
inconspicuus, *Baker.* 126
Jacquemontii, Bunge. 134
khasianus, *Benth.* . 130
kongrensis, *Benth.* . 120
lasiocladus, Benth. . 135
leptacanthus, Benth. 135
leptocentrus, *Bunge.* 135
lessertioides, *Benth.* 124
leucocephalus, *Grah.* 128
longicaulis, *Baker.* 129
longipes, Kar. & Kir. 128
macropterus, *DC.* . 128
macrorhizus, Don. . 119
maddenianus, *Bth.* . 127
malacophyllus, *Bth.* 133
Maxwellii, *Royle.* . 124
medullaris, Boiss. . 131
melanostachys, *Bth.* 125
microphyllus, Jacq. 134
minutus, Boiss. . 122
missourensis, Camb. 118
Moorcroftianus, Wall. 249
multiceps, *Wall.* . 134
Munroi, *Benth.* . 128
mutabilis, Jacquem. 125
nivalis, *Kar. & Kir.* 136
nubigenus, Don. . 117
ophiocarpus, *Benth.* 122
oplites, Benth. . . 134
oxyodon, *Baker* . 125
peduncularis, *Royle* 136
podocarpus, Grah. . 130
polycanthus, *Royle* 134
polycanthus, Wall. 116
prolixus, *Sieber* . 121
psilocentrus, Fisch. 134
Page
puberulus, K. & K. 128
pycnorhizus, *Wall.* 119
pyrrhotrichus, *Boiss.* 133
rhizanthus, *Royle* . 131
rigidulus, *Benth.* . 123
rotundifolius, Royle 131
Royleanus, Bunge. . 132
scariosus, Benth. . 134
scorpiurus, Bunge. . 119
Scottianus, Stocks . 131
sesbanoides, Benth. . 121
sikkimensis, *Benth.* 126
Stewartii, *Baker* . 129
stipulatus, *D. Don.* 131
stipulatus, Jacquem. 131
strictus, *Grah.* . . 124
strobiliferus, *Royle* 135
subulatus, *M. Bieb.* 136
subumbellatus, *Kl.* 119
tenuicaulis, *Benth.* 126
tenuispinus, Bunge. 134
Thomsonianus, Bth. 136
tibetanus, Benth. . 124
tribulifolius, *Benth.* 120
tribuloides, *Delile* . 122
trichocarpus, *Grah.* 121
vesiculosus, Jacquem. 138
vicioides, *Grah.* . . 131
vicioides, Led. . . 128
Webbianus, *Grah.* . 132
xiphocarpus, *Benth.* 129
zanskarensis, *Benth.* 134
Astranthus fœtida, Wall. 598
Astronia, *Blume* . . 550
smilacifolia, *Triana* 550
ASTRONIEÆ 513
Astronium insigne, Marchand 30
Astropetalum, Griff. 26, 27
Athamanta achilleifolia, Wall. . . . 684
Ajowan, Wall. . . 682
anethifolia, Wall. . 683
depressa, Don. . . 701
diffusa, Wall. . . 693
gigantea, Don. . . 720
Roxburghiana, Wall. 682
teres, Don. . . . 720
Atylosia, *W. & A.* . . 212
albicans, *Benth.* . . 215
barbata, *Baker* . . 216
candicans, Kurz. . 222
Candollei, *W. & A.* . 212
circinalis, Benth. . 219
elongata, *Benth.* . 215
geminiflora, Dalz. . 212
glandulosa, Dalz. . 213

Page
goensis, Dalz. . . . 216
grandiflora, *Benth.* . 214
kulnensis, *Dalz.* . . 214
Lawii, Wight. . . 213
lineata, *W. & A.* . 213
major, W. & A. . . 212
mollis, *Benth.* . . 213
nivea, *Benth.* . . 214
platycarpa, *Benth.* . 216
punctata, Dalz. . . 218
rostrata, *Baker* . . 216
rugosa, *W. & A.* . . 215
scarabæoides, *Bth.* . 215
sericea, *Benth.* . . 213
subrhombea, Miq. . 218
villosa, *Benth.* . . 214
Aubletia caseolaris, Gærtn. 580
Aucuba, *Thunb.* . . 747
himalaica, *H. f.* . 747
Aulacospermum simplex, Ost. & Russ. 705
Axinandra, *Thwaites* . 581
Beccariana, Baill. . 581
Maingayai, *C. B. C.* 581
zeylanica, *Thwaites* . 581
Axonotechium trianthemoides, Fenzl. . 661
Badamia Commersoni, Gærtn. 444
Bæckea, *Linn.* . . . 463
chinensis, Gærtn. . 463
Cumingiana, Sch. . 463
frutescens, *Linn.* . 463
Balansæa Fontanesii, *Boiss & Reut.* . . 691
Baptisia nepalensis, Hook. 62
Barringtonia, *Forst.* . 506
acutangula, *Gærtn.* . 508
alata, Wall. . . . 508
alba, Miq. . . . 507
asiatica, Kurz. . . 507
augusta, *Kurz.* . . 509
ceylanica, *Gardn.* . 508
conoidea, *Griff.* . . 508
cylindrostachya, Griff. 509
Helferi, *C. B. Clarke* 509
inclyta, Miers . . 507
macrophylla, Miq. . 507
macrostachya, *Kurz.* 509
pterocarpa, *Kurz* . 509
pubescens, *Miers* . 509
racemosa, *Thwaites* . 508
racemosa, Blume . 507
rigida, *C. B. Clarke* 510
rubra, Miers . . . 507

Page
rubra, Miq. . . . 507
sarcostachys, Miq. . 509
speciosa, *Forst.* . . 507
speciosa, Wall. . . 507
Batschia laurifolia, Vahl. 273
Bauhinia, *Linn.* . . 275
acida, Reinw. . . 277
acuminata, *Linn.* . 276
anguina, *Roxb.* . . 284
Benthami, Bedd. . 283
bidentata, *Jack.* . . 279
Blancoi, *Baker* . . 278
brachycarpa, *Wall.* . 276
bracteata, *Grah.* . 282
Buchanani, *Desv.* . 278
candida, Ait. . . . 276
candida, Roxb. . . 284
cordifolia, Roxb. . 278
cornifolia, *Baker* . 278
coromandeliana, DC. 284
diphylla, *Hamilt.* . 278
divergens, *Baker* . 282
elongata, *Korthals* . 281
emarginata, *Jack.* . 278
emarginata, Wall. . 279
ferruginea, *Roxb.* . 283
Finlaysoniana, *Grah.* 278
? *foveolata*, Dalz. . 277
glabrifolia, *Baker* . 281
glauca, *Wall.* . . 282
integrifolia, *Roxb.* . 279
involucellata, *Kurz.* 282
khasiana, *Baker* . . 281
Lawii, *Benth.* . . 277
lucida, Wall. . 278, 285
macrostachya, *Wall.* 281
malabarica, *Roxb.* . 277
mollissima, Wall. . 281
monandra, *Kurz.* . 285
nervosa, *Wall.* . . 283
ornata, *Kurz.* . . 281
parviflora, Vahl. . 276
parvifolia, *Teysm. & Binnend.* . . . 283
phœnicea, *Heyne* . 283
piperifolia, Roxb. . 285
polycarpa, *Wall.* . 276
Pottsii, G. Don. . . 283
purpurea, *Linn.* . . 284
purpurea, DC. . . 277
purpurea, Wall. 276, 284
racemosa, *Lam.* . . 276
racemosa, Vahl. . . 279
reniformis, *Royle* . 277
retusa, *Ham.* . . . 279
rosea, *Kurz.* . . . 280
rufa, *Grah.* . . . 280

Page
rufescens, Lam. . . 277
ruficarpa, Desv. . . 283
scandens, Linn. . . 284
scandens, Roxb. . . 282
semibifida, *Roxb.* . 280
speciosa, Roxb. . . 275
spicata, Kœnig . . 276
timoriensis, Dcne. . 276
tomentosa, *Linn.* . 275
tomentosa, Wall. . 277
triandra, Roxb. . . 284
unguiculata, *Baker* . 277
Vahlii, *W. & A.* . . 279
variegata, *Linn.* . 284
velutina, *Wall.* . . 280
BAUHINIEÆ 61
Begonia, *Linn.* . . . 635
alæcida, *C. B. Clarke* 637
albo-coccinea, *Hook.* 654
amœna, *Wall.* . . 642
andamensis, *Parish* . 650
Arnottiana, A. DC . 641
barbata, *Wall.* . . 646
barbata, Wall. . . 645
Bowringiana, Champ. . . . 645
Brandisiana, *Kurz.* . 654
brevicaulis, *A.DC.* . 647
canarana, *Miq.* . . 652
Cathcartii, *H. f.* . 646
concanensis, *A. DC.* 653
cordifolia, *Thwaites* 641
crenata, *Dryand.* . 651
delicatula, *Parish* . 652
dipetala, Grah. . . 655
Dux, *C. B. Clarke* . 637
echinata, Royle . . 638
elongata, Wall. . . 650
episcopalis, *C. B. C.* 644
erosa, Wall. . 638, 642
Evansiana, *Andr.* . 638
fallax, *A. DC.* . . 643
fibrosa, *C. B. Clarke* 652
? *Finlaysoniana*, Wall. 649
flaccidissima, *Kurz* . 651
floccifera, *Bedd.* . . 654
gemmipara, *H. f.* . 641
gigantea, *Wall.* . . 643
gigantea, Wall. . . 636
goniotis, *C. B. C.* . 648
Grahamiana, Wight. 654
Griffithii, *Hook.* . . 647
guttata, *Wall.* . . 648
guttata, Wall. . . 650
hydrophila, Miq. . 655
inflata, *C. B. Clarke* 636
integrifolia, *Dalz.* . 648

Page
Josephi, *A. DC.* . . 639
Josephi, A. DC. . . 639
khasiana, *C. B. C.* . 656
laciniata, *Roxb.* . . 645
Lobbiana, A. DC. . 640
malabarica, *Lamk.* . 655
malabarica, Roxb. . 635
malabarica, Wall. . 646
martabanica, *A. DC.* 651
megaptera, *A. DC.* . 646
minima, Bedd. . . 651
modestiflora, *Kurz.* 640
moulmeinensis, *C. B. Clarke* . . 643
nemophila, Kurz . 646
nivea, *Parish* . . . 654
obliqua, Thunb. . . 638
ovatifolia, *A. DC.* . 642
paleacea, *Kurz* . . 650
? *palmata*, Don. . . 645
Parishii, *C. B. C.* . 651
parviflora, Wall. . 640
parvuliflora, *A. DC.* 640
pedunculosa, *Wall.* . 639
pedunculosa, Wall. . 656
picta, *Sm.* . . . 638
procridifolia, *Wall.* . 648
prolifera, *A. DC.* . 649
Rex, *Putzeys* . . . 647
Roxburghii, *A. DC.* 635
rubella, Miq. . . . 652
rubella, Wall. . . 642
rubro-venia, *Hook.* . 645
sandalifolia, *C. B. Clarke* 649
Satrapis, *C. B. C.* . 638
scutata, *Wall.* . . 642
scutata, Wall. . . 639
sikkimensis, *A. DC.* 646
silhetensis, *C. B. C.* 636
sinensis, A. DC. . . 638
sinuata, *Wall.* . . 650
subovata, Wall. . . 642
subpeltata, *Wight.* . 653
subperfoliata, *Par.* . 643
subrotunda, Wall. . 650
surculigera, *Kurz.* . 640
tenella, Don. . . . 642
tenera, *Dryand.* . . 652
tenuifolia, *Dryand.* . 656
tessaricarpa, *C. B. Clarke* 636
Thomsonii, *A. DC.* . 647
Thwaitesii, Hook. . 652
trichocarpa, *Dalz.* . 653
tricuspidata, *C. B. Clarke* 637
triradiata, *C. B. C.* 637
tuberosa, Hb. Madr. 655
velutina, Parish . . 640
verticillata, *Hook.* . 649
Wallichiana, *A. DC.* 655
Wightiana, Wall. . 654
xanthina, *Hook.* . . 644
BEGONIACEÆ . . . 635
Benincasa, *Savi.* . . 616
cerifera, *Savi.* . . 616
Benthamia fragifera, Lindl. 745
Biancæa mimosoides, Todaro 256
sappan, Todaro . . 255
scandens, Todaro . 256
Biforis benghalensis, Wall. 696
glauca, Wall. . . 696
Bistella geminiflora, Delile 399
Blackwellia acuminata, Wall. 596
dasyantha, Turcz. . 597
fœtida, Wall. . . 597
macrostachya, Turcz. 596
nepalensis, Wall. . 596
propinqua, Wall. . 597
spiralis, Wall. 596, 597
spiralis, Wall. . . 596
tetrandra, Wight. . 597
tomentosa, Vent. . 596
Zeylanica, Gardn. . 597
Blastus, *Lour.* . . . 528
cochinchinensis, *Lour.* 528
Blepharistemma, *Wall.* 441
corymbosum, *Wall.* . 441
Botryolotus cachemyrianus, Jaub. . . 88
Bouea, *Meissn.* . . 20
Brandisiana, Kurz. 21
burmanica, *Griff.* . 21
diversifolia, Miq. . 21
gandaria, Blume . 21
macrophylla, *Griff.* 21
microphylla, *Griff.* 21
myrsinoides, Blume. 21
oppositifolia, Meissn. 21
Brachypterum Benthami, Thwaites . 242
canarense, D. & G. . 248
elegans, Thwaites . 240
robustum, D. & G. . 241
scandens, D. & G. . 240
Brassaia, *Endl.* . . . 732
capitata, *C. B. Clarke* 732
Brassaiopsis, *Dcne. & Planch.* 735
aculeata, *Seem.* . . 738
alpina, *C. B. Clarke* 736
confluens, Seem. 732, 735
floribunda, Seem. . 737
Griffithii, *C. B. C.* . 736
Hainla, *Seem.* . . 735
hispida, *Seem.* . . 736
Hookeri, *C. B. C.* . 737
mitis, *C. B. Clarke* . 736
palmata, *Kurz* . . 735
simplicifolia, *C. B. Clarke* 735
speciosa, *Dcne. & Pl.* 737
Bruguiera, *Lam.* . . 437
caryophylloides, *Blume.* 438
eriopetala, *W. & A.* 438
gymnorhiza, *Lamk.* . 437
madagascariensis, DC. 452
malabarica, *Arn.* . 438
parietosa, Griff. . . 438
parviflora, *W. & A.* 438
Rheedii, Miq. . . 437
Rumphii, Blume. . 438
Wightii, *Bl.* . . . 437
Bryonia, *Linn.* . . . 622
alceæfolia, Hb. Rottl. 621
althæioides, DC. . . 623
amplexicaulis, Lamk. 625
callosa, Hb. Rottl. 619
cheirophylla, Wall. . 614
cissoides, Wall. . . 624
cochinchinense, Lour. 611
deltoidea, Arn. . . 626
epigæa, Rottler . . 628
filicaulis, Wall. . . 627
? *filiformis*, Roxb. . 624
Garcini, DC. . . 630
glabra, Roxb. . . 628
gracilis, Wall. . . 623
grandis, Linn. . . 621
grandis, Wall. . . 617
heterophylla, Wall. . 629
Hookeriana, W. & A. 624
laciniosa, *Linn.* . . 622
leiosperma, W. & A. 623
maderaspatana, DC. 625
mucronata, Blume . 624
mysorensis, Miq. . 623
mysorensis, Wall. . 624
nepalensis, Seringe . 625
odorata, Ham. . . 626
odorata, Wall. . . 626
? *oxyphylla*, Wall. . 624
palmata, Wall. 607, 621

Page
? pedunculosa, Ser. . 613
Perrottetiana, Ser. . 627
pilosa, Roxb. . . . 627
Rheedii, Blume . . 625
rostrata, Rottler . 627
sagittata, Blume . 625
scabrella, Linn. f. . 623
sinuata, Wall. . . 628
sinuosa, Wall. . . 625
tenella, Roxb. . . 626
triflora, Wall. . . 626
tubiflora, W. & A. . 611
umbellata, Klein . 625
umbellata, Wall. . 609
Wightiana, Wall. . 623
Bryonopsis courtallensis, Arn. 623
erythrocarpa, Naud. 623
laciniosa, H. f. . . 623
Bryophyllum, Salisb. . 413
calycinum, *Salisb.* . 413
pinnatum, Kurz . . 413
Buchanania, *Roxb.* . 22
acuminata, *Turcz.* . 24
acuminata Wall. . 24
angustifolia, *Roxb.* 23
auriculata, Blume . 41
glabra, *Wall.* . . 23
intermedia, Wight . 24
lanceolata, *Wight* . 24
lancifolia, *Roxb.* . 24
latifolia, *Roxb.* . . 23
laxiflora, *Kurz* . . 24
lucida, *Blume* . . 23
macrophylla, Blume 41
palembanica, Blume 24
sessilifolia, Blume . 24
subobovata, Griff. . 24
zeylanica, Blume . 16
Bucklandia, *Br.* . . 429
populifolia H. f. & T. 429
populnea, *Br.* . . 429
Bunium aromaticum, Linn. 682
Bulbocastanum, Linn. 681
Bupleurum, *Linn.* . . 674
baldense, Boiss. . . 676
distichophyllum, *W. & A.* 677
diversifolium, *Roche* 675
Candollii, *Wall.* . 674
falcatum, *Linn.* . . 676
falcatum, D. & G. . 676
flexuosum, Wall. . 677
gracillimum, Kl. . 676
heterophyllum, Jacquem. 675

Page
himalensis, *Kl.* . . 677
Hoffmeisteri, *Kl.* . 676
imaicolum, A. Kerner 676
jucundum, *Kurz* . 675
lanceolatum, *Wall.* 674
longicaule, *Wall.* . 677
Maddeni, *C. B. C.* . 678
marginata, *Wall.* . 676
mucronatum, *W. & A.* 676
nervosum, Moon Cat. 676
nigrocarpa, *Jacquem.* 676
plantaginifolium, *Wight* 674
ramosissima, *W. & A.* 676
ramosissimum, W. & A. 570
rupestre, Edgw. . . 677
sachinalense, F. Schmidt . . . 675
setaceum, *Fenzl.* . 678
tenue, *Don* . . . 677
Thomsoni, *C. B. C.* 675
trichopodum, Boiss. & Sprun. . . . 678
virgatum, W. & A. . 676
virgatum, Wall. . 676
Bursinopetalum arboreum, Wt. . . . 745
tetrandum, Wt. . . 745
Butea, *Roxb.* . . . 194
acuminata, Wall. . 194
frondosa, *Roxb.* . . 194
frondosa, Wall. . . 195
gyrocarpa, Wall. . 193
minor, *Ham.* . . . 195
parviflora, Roxb. . 193
sericophylla, Wall. . 193
superba, *Roxb.* . . 195
Butinia capnoides, Dcne. 691
libanotica, Boiss. . 673
Butonica *alata*, Miers. 508
alba, Miers. . . . 507
ceylanica, Miers. . 508
racemosa, Miers. . 509

CACTEÆ 657
Cacoucia lucida, Hassk. 454
? trifoliata, DC. . . 454
Cæsalpinia, *Linn.* . . 254
arborea, Miq. . . 257
armata, Grah. . . 256
? axillaris, DC. . . 258
bijuga, Wall. . . 255
Bonduc, *Roxb.* . . 255
Bonducella, *Fleming* 254

Page
cinclidocarpa, *Miq.* 256
crista, Thunb. . . 256
cucullata, Roxb. . 258
dasyrachis, Miq. . 257
digyna, Rottl. . . 256
elata, Schwartz . . 260
enneaphylla, Roxb. . 258
ferox, Hassk. . . 256
ferox, Hohen. . . 261
ferruginea, Miq. . . 257
Finlaysoniana, Grah. 257
flavicans, Grah. . . 256
furfuracea, Wall. . 258
Glenniei, Thwaites . 257
gracilis, Miq. . . 256
horrida, Wall. . . 256
hymenocarpa, Wall. 259
inermis, Roxb. . . 257
japonica, Sieb. & Zucc. 256
lacerans, Roxb. . . 259
microphylla, Ham. . 257
mimosoides, *Lam.* . 256
mimosoides, Heyne . 261
Nuga, *Ait.* . . . 255
oleosperma, Roxb. . 256
paniculata, Roxb. . 255
pulcherrima, *Swtz.* 255
resupinata, Roxb. . 256
Sappan, *Linn.* . . 255
scandens, Kœnig. . 255
sepiaria, *Roxb.* . . 256
sepiaria, Wall. . . 258
Simora, Ham. . . 256
sumatrana, Roxb. . 259
sumatrana, Wall. . 255
tortuosa, *Roxb.* . . 257
tortuosa, Wall. . . 257
CÆSALPINIEÆ . . . 60
CAJANEÆ 60
Cajanus, *DC.* . . . 217
albicans, Grah. . . 215
bicolor, DC. . . . 217
bicolor, Wall. . . 217
candicans, Wall. . 222
flavus, DC. . . . 217
glandulosus, D. & G. 213
goensis, Dalz. . . 216
indicus, *Spreng.* . . 217
kulnensis, Dalz. . . 214
lineatus, Grah. . . 213
nivens, Grah. . . 214
scarabæoides, Thou. 215
suaveolens, Grah. . 222
Wightianus, Grah. . 215
Calliandra, *Benth.* . . 302
cynometroides, Bedd. 306
Griffithii, *Benth.* . 302

Page
umbrosa, *Benth.* . . 302
Callitriche, *Linn.* . . 434
stagnalis, *Scop.* . . 434
verna, *Linn.* . . . 434
Wighiiana, Wall. . 434
Calpurnia, *E. Meyer* . 251
aurea, *Baker* . . . 251
Calycopteris, *Lamk.* . 449
floribunda, *Lamk.* . 449
nutans, Kurz . . . 449
Calyptranthes capitellata, Ham. . . 499
caryophyllata, Pers. 490
cordifolia, Moon 491, 493
costata, Ham. . . 498
cuneata, Ham. . . 498
Dauca, Ham. . . 500
grandis, Ham. . . 498
Jambolana, Moon . 493
Jambolana, Willd. . 499
mangiferifolia, Hance 498
obtusifolia, Ham. . 481
oleina, Wight . . 483
pyrifolia, Blume . 487
Tatna, Ham. . . 408
tenuis, Ham. . . . 500
Cambessedea, W. & A. 21
Campnosperma, *Thw.* 40
auriculata, *H. f.* . 41
Griffithii, *Marchand* 41
macrophylla, *H. f.* . 41
zeylanicum, *Thw.* . 41
Campylotropis, Bunge 143
Canavalia, *DC* . . . 195
dolichoides, Kurz . 207
ensiformis, *DC.* . . 195
gladiata, DC. . . 195
grandis, Kurz . . 204
incurva, DC. . . 196
lineata, DC. . . 196
Loureirii, G. Don . 196
lucens, Kurz . . . 207
mollis, *Wall.* . . . 196
obtusifolia, *DC.* . . 196
rosea, DC. 196
rutilans, DC. . . . 196
Stocksii, D. & G. . 196
turgida, *Grah.* . . 196
virosa, W. & A. . 196
Cantharospermum albicans, W. & A. . 215
distans, Royle . . 216
nervosum, Royle . 216
pauciflorum, W. & A. 215
Canthium glomeratum, Miq. 565
Caragana, *Lam.* . . . 115

Page
brevispina, *Royle* . 116
conferta, *Benth.* . 116
crassicaulis, *Benth.* 117
cuneata, *Baker* . . 117
Gerardiana, *Royle* . 116
Moorcroftiana, Bth. 249
nubigena, Bunge . 117
polyacantha, *Royle* . 116
pygmæa, *DC.* . . 116
spinosissima, Benth. 116
versicolor, Benth. . 116
Carallia, *Roxb.* . . . 439
calycina, *Thwaites* . 439
ceylanica, Arn. . . 439
confinis, Blume . . 439
corymbosa, Arn. . . 439
integerrima, *DC.* . 439
lanceæfolia, *Roxb.* . 439
lanceolaria, Wall. . 439
lucida, Kurz . . . 439
lucida, Roxb. . . 439
octopetala, F. Muell. 439
sinensis, Arn. . . 439
symmetrica, Blume . 439
timorensis, Blume . 439
Careya, *Roxb.* . . . 510
arborea, *Roxb.* . . 511
herbacea, *Roxb.* . . 510
macrostachya, Jack . 509
orbiculata, *Miers* . 511
pendula, Griff. . . 509
sphærica, *Roxb.* . . 511
Carica Papaya, *L.* . 599
Carpopogon anguineum, Roxb. . . 185
atropurpureum, Roxb. 186
bracteatum, Roxb. . 187
capitatum, Roxb. . 187
giganteum, Roxb. . 186
imbricatum, Roxb. . 185
monospermum, Roxb. 185
niveum, Roxb. . . 188
pruriens, Roxb. . . 187
Carum, *Linn.* . . . 680
anethifolium, *Benth.* 683
Bulbocastanum, *G. Koch* . . . 681
Carui, *Linn.* . . . 680
copticum, *Benth.* . 682
diversifolium, *C. B. Clarke* . . 681
Falconeri, *C. B. C.* 683
khasianum, *C. B. C.* 682
nothum, *C. B. Clarke* 681
Roxburghianum, *Benth.* 682
stictocarpum, *C. B. C.* 681

Page
Casearia, Jacq. . . . 591
? acuminata, Wall. . 595
albicans, *Wall.* . . 593
Anavinga, D. & G. 593
astyla, Turcz. . . 595
Canziala, Ham. . . 593
Championii, Thw. . 592
cinerea, Turcz. . . 594
coriacea, *Thwaites* . 592
coriacea, Wall. . . 595
Dallichii, F. Muell. 593
elliptica, Willd. . . 593
esculenta, *Roxb.* . . 592
glabra, Hort. Calc. . 593
glabra, Kurz. . . 591
glomerata, *Roxb* . . 591
glomerata, Kurz . . 594
graveolens, *Dalz.* . 592
grewiaefolia, *Vent.* 594
Hamiltoni, Wall. . 592
Kurzii, *C. B. Clarke* 594
lævigata, Dalz. . . 592
leucolepis, *Turcz.* . 591
Lobbiana, *Turcz.* . 594
? lucida, Wall. . . 595
macrocarpa, *C. B. Clarke* 593
macrogyna, Turcz. . 592
ovata, Roxb. . . . 593
ovata, Wall. . . . 591
paniculata, Gardn. . 595
rubescens, *Dalz.* . . 593
subcuneata, Miq. . 596
tomentosa, *Roxb.* . 593
Vareca, *Roxb.* . . 593
variabilis, Blume. . 594
varians, Thwaites. . 592
? viridiflora, Lamk. 591
wynadensis, *Bedd.* . 594
zeylanica, Thwaites 592
Casparya ? oligocarpa, DC. 635
polycarpa, DC. . . 635
? silhetensis, A. DC. 636
Cassia, *Linn.* . . . 261
Absus, *Linn.* . . . 265
alata, *Linn.* . . . 264
amœna, Ham . . . 266
angustifolia, Vahl. . 264
angustissima, Lam. . 266
arborescens, Vahl. . 265
auricoma, *Grah.* . 266
auriculata, *Linn.* . 263
Bacillus, Gaertn. . 267
bicapsularis, Linn. . 263
bracteata, Linn. f. . 264
Burmanni, Wight . 264
chinensis, Jacq. . . 262

Page
coccinea, Wall. . . 265
coromandeliana, Jacq. 262
dimidiata, *Roxb.* . 266
dimidiata, Klein. . 266
esculenta, Roxb. . 262
exigua, Roxb. . . 265
fastigiata, Vahl. . 265
Fistula, *Linn.* . . 261
florida, Vahl. . . 264
fœtida, Pers. Syn. . 262
fœtida, Salisb. . . 263
frutescens, Mill. . 262
gallinaria, Collad. . 263
glauca, *Lam.* . . . 265
herpetica, Jacq. . . 264
hirsuta, Linn. . . 263
Horsfieldii, Miq. . 265
humilis, Collad. . . 263
Javanica, Linn. . . 267
Kleinii, *W. & A.* . 266
lanceolata, Wall. . 264
Leschenaultii, Wall. 266
marginata, *Roxb.* . 262
mimosoides, *Linn.* . 266
montana, *Heyne* . . 264
myriophylla, Wall. . 266
nodosa, *Ham.* . . 261
obovata, *Collad.* . 264
obtusa, Roxb. . . . 264
obtusifolia, Linn. . 263
occidentalis, *Linn.* . 262
palmata, Wall. . . 265
prostrata, Roxb. . 266
pumila, *Lam.*. . . 266
purpurea, *Roxb.* . 263
purpurea, Bot. Reg. 263
renigera, *Wall.* . . 262
rhombifolia, Roxb. . 261
Roxburghiana, Grah. 266
Roxburghii, DC. . . 262
Senna, Linn. . . . 264
sensitiva, Roxb. . . 266
setigera, DC. . . . 265
Siamea, *Lam.* . . 264
Sophera, *Linn.* . . 262
Sophera, Wall. . . 262
speciosa, Roxb. . . 265
suffruticosa, *Kœnig*. 265
suffruticosa, Wall. . 265
sumatrana, Roxb. . 264
surattensis, Burm. . 365
Telfairiana, Wall. . 266
tenella, Roxb. . . 266
timoriensis, *DC.* . 265
tomentosa, Linn. . 263
Tora, *Linn.* . . . 263
toroides, Roxb. . . 263

Page
Wallichiana, *DC.* . 266
Wightiana, Grah. . 263
Cassieæ 61
Catappa Benzoin, Gærtn. 444
domestica, Rumph. . 444
litorea, Rumph. . . 444
sylvestris, Rumph. . 444
Catenaria laburnifolia, Benth. . . 163
Caucalis, *Linn.* . . 718
Anthriscus, *Scop.* . 718
elata, Wall. . . . 718
latifolia, *Linn.* . . 719
leptophylla, *Linn.* . 719
Celastrinea, Wall. . . 3
Celastrus racemosa, Wall. 312
Cephalandra, *Schrad.* 621
indica, *Naud.* . . 621
Schimperi, Naud. . 621
Wightiana, Roem . 621
Cerasiocarpum, *H. f.* . 628
? *Maingayi*, C. B. Clarke 629
? *penangense*, C. B. Clarke 629
zeylanicum, *H. f.* . 629
Cerasus capricida, Wall. 316
cornuta, Wall. . . 315
glaucifolia, Wall. . 316
integerrima, Wall. . 317
Lindleyana, Wall. . 316
phoshia, Ham. . . 314
Puddum, Wall. . . 314
tomentosa, Wall. . 314
undulata, Ser. . . 316
Ceratostachys arborea, Bl. 747
Ceriops, *Arn.* . . . 437
Candolleana, *Arn.* . 436
Roxburghiana, *Arn.* 436
Cerocarpus aqueus, Hassk. 473
bifaria, Colebr. . . 475
Chænolobium decemjugum, Miq. . . 253
septemjugum, Miq. . 253
Chærophyllum, *Linn.*. 690
acuminatum, *Lindl.* 691
cachemiricum, *C. B. Clarke* 691
capnoides, *Benth.* . 691
gracillimum, Kl. . 671
millefolium . . . 671
reflexum, *Lindl.* . 691

Page
villosum, *Wall.* . . 690
villosum, Wall. . . 691
Chætocarpus castanocarpus, Thw. . . 595
Chamærhodos, *Bunge.* 360
sabulosa, *Bunge.* . 360
Chesneya vaginalis, Jaub. & Spach. . 117
Chrysobalanea arborescens, R. Br. . . . 322
Chrysobalaneæ . . . 307
Chrysobalaneus, Wall. 318
Chrysobalanus Icaco, Linn. 307
Chrysosplenium, *Linn.* 400
adoxoides, Maxim. . 401
alternifolium, *Linn.* 400
carnosulum, Maxim. 401
carnosum, *H. f. & T.* 400
Griffithii, *H. f. & T.* 401
lanuginosum, *H. f. & T.* 401
nepalense, *Don.* . . 400
sulcatum, *Maxim.* . 400
tenellum, *H. f. & T.* 401
trichospermum, *Edgw.* 400
Cicer, *Linn.* 176
arietinum, *Linn.* . 176
Jacquemontii, Jaub. & Spach. . . . 176
Lens, *Willd.* . . . 179
microphyllum, Bth. 176
numulariæfolium, Lamk. 66
soongaricum, *Steph.* 176
Cicuta, *Linn.* . . . 679
virosa, *Linn.*. . . 679
Cicutaria aquatica, Lamk. 679
Cinclidocarpus nitidus, Zoll. & Mor. . . 2?7
Circæa, *Linn.* . . . 589
alpina, *Linn.*. . . 589
cordata, *Royle.* . . 589
intermedia, Wall. . 589
lutetiana, *Linn.* . . 589
repens, Wall. . . . 589
Citrullus, *Schrader.* . 620
Colocynthis, *Schrad.* 620
fistulosus, Stocks. . 621
vulgaris, *Schrad.* . 621
Clavimyrtus ramosissima, Blume . . 480
Clavulium pedunculosum, Desv. . . 84
Clitoria, *Linn.* . . . 208
acuminata, Grah. . 208

Page
biflora, *Dalz.* . . . 208
cajanæfolia, *Benth.* . 209
Grahami, Steud. . 208
macrophylla, *Wall.* 209
mariana, *Linn.* . . 208
mexicana, Link. . . 208
pilosula, Wall. . . 208
CNESTIDEÆ 46
Cnestis, *Juss.* . . . 54
acuminata, Wall. . 48
flaminea Griff. . . 54
monadelpha, Roxb. . 47
platantha, Griff. . 54
ramiflora, *Griff.* . 54
stenopetala, Griff. . 49
vestita, Wall. . . . 47
Cnidium diffusum, DC. 693
Coccinia indica, W. & A. 621
Cochlianthus, *Benth.* . 192
gracilis, *Benth.* . . 193
Codariocalyx conicus, Hassk. . . . 175
gyrans, Hassk. . . 174
gyroides, Hassk. . 175
Collæa cinerascens, Grah. 213
gibba, Grah. . 217, 218
mollis, Grah. . . . 213
trinervia, DC. . . 212
venosa, Grah. . . . 217
Colutea, *Linn.* . . . 103
arborescens, *Linn.* . 103
nepalensis, Linn. . 103
Comarum flavum, Roxb. 359
Salessovii, Bunge. . 348
Combesia abyssinica, A. Rich. . . . 412
COMBRETACEÆ . . . 443
Combretum, *Linn.* . . 453
aculeatum, *Vent.* . 453
acuminatum, *Roxb.* 455
albidum, G. Don. . 458
attenuatum, Wall. . 456
apetalum, *Wall.* . 453
chinense, *Roxb.* . . 457
costatum, Roxb. . . 455
dasystachyum, *Kurz* 457
decandrum, *Roxb.* . 452
elegans, Wall. . . 454
extensum, *Roxb.* . 458
flagrocarpum, *Herb. Calc.* 455
formosum, Griff. . 458
Griffithii, Hk. & Muell. 457
Page
Heyneanum, Wall. . 458
Harsfieldii, Miq. . 458
insigne, Hk. & Muell. 453
lætum, Wall. . . . 453
latifolium, Blume . 458
laxum, Roxb. . . 458
lepidotum, Presl. . 456
leucanthum, Heurck & Muell. 458
lucidum, Blume. . 454
macrostachyum, Wall. 458
malulæa, Wall. . . 456
nanum, *Ham.* . . . 457
neurophyllum, ? Miq. 455
ovale, Br. 459
ovalifolium, *Roxb.* . 458
pilosum, *Roxb.* . . 458
platyphyllum, Heurck & Muell. 458
Porterianum, *Wall.* 457
pyrifolium, *Kurz.* . 453
quadrangulare, *Kurz* 456
rotundifolium, Roxb. 458
Roxburghii, G. Don. 458
Roxburghii, Spreng. 452
sarcopterum, Thw. 455
semi-adnatum, Heurck & Muell. 459
sericeum, Wall. . . 450
spinescens, Wall. . 453
squamosum, *Roxb.* . 456
stenopetalum, Heurck & Muell. 455
subalternans, Wall. . 454
sudaicum, *Miq.* . . 458
ternatum, *Wall.* . 457
tetragonocarpum, *Kurz* 454
tetralophum, *C. B. Clarke* 454
Thwaitesianum, Heurck & Muell. 453
trifoliatum, *Vent.* . 454
undulatum, Wall. . 454
virgatum, Wall. . 453
Wallichii, *DC.* . . 456
Wallichii, Kurz . 455
Wightianum, Thw. . 458
Wightianum, Wall. 458
CONNARACEÆ . . . 46
Connarus, *Linn.* . . 50
asiaticus, Willd. . 50
Championii, *Thw.* . 52
ferrugineus, *Jack.* . 51
floribundus, Wall. . 52
foliolosus, Jack. . . 54
Page
fulgens, Wall. . . 49
gibbosus, *Wall.* . . 52
grandis, *Jack.* . . 53
Griffithii, *H. f.* . . 52
igneus, Wall. . . 54
Jackianus, *Wall.* . 54
latifolius, *Wall.* . . 53
Maingayi, *H. f.* . . 53
mimosoides, Jack. . 49
mimosoides, Vahl. 49, 50, 54
monocarpus, *Linn.* . 50
monocarpus, W. & A. 47
monophyllus, Wall. . 56
oliogophyllus, *Plch.* 53
paniculatus, *Roxb.* . 52
pentandrus, Roxb. . 52
pinnatus, Lamk. . 50
Ritchiei, *H. f.* . . 51
rugosus, Wall. . . 48
santaloides, Vahl. . 47
semidecandrus, *Jack.* 52
unifoliatus, Thw. . 55
velutinus, *Wall.* . . 54
Wallichii, Planch. . 53
Wightii, *H. f.* . . 51
Conocarpus acuminata, Roxb. 450
latifolia, DC. . . 450
Copisma, *E. Meyer.* . 223
Corallocarpus, *Welw.* . 627
conocarpa, *H. f.* . . 628
epigæa, *H. f.* . . 628
? *etbaicus*, H. f. . . 628
Fenzlii, H. f. . . 628
velutina, *H. f.* . . 628
Coriandrum, *Linn.* . 717
sativum, *Linn.* . . 717
Coriaria, *Linn.* . . . 44
nepalensis, *Wall.* . 44
CORIARIEÆ 44
CORNEÆ 740
Cornus, *Linn.* . . . 744
australis, C. A. Mey. 744
brachypoda, C. A. Mey. 744
capitata, *Wall.* . . 745
macrophylla, *Wall.* 744
oblonga, *Wall.* . . 744
sanguinea, *Linn.* . 744
Coronilla aculeata, Willd. 115
cannabina, Willd. . 115
grandiflora, Willd. . 115
Sesban, Willd. . . 114
Cortia, *DC.* 701
elata, Edgw. . . . 698
Hookeri, *C. B. C.* . 702

Page
Lindleyii, *DC.* . . . 701
vaginata, Edgw. . 700
Corylopsis, *S. & Z.* . 427
Himalayana, *Griff.*. 427
Coryzadenia trifoliata, Griff. 460
Cotoneaster, *Linn.* . 384
acuminata, Lindl. . 385
acuminata, Dcne. . 387
affinis, DC. . . . 387
? *affinis*. Hohen. . 385
affinis, Lindl. . . . 383
bacillaris, *Wall.*. . 384
? *buxifolia*, Baker . 387
buxifolia, *Wall.*. . 387
congesta, Baker. . . 387
emarginata, Hoffm. 387
frigida, *Wall.* . . 385
lanata, Hort. . . . 387
Lindleyi, Steud. . 386
microphylla, *Wall.* . 387
microphylla, Lindl. 386
microphylla, Wall. . 387
multiflora, *Bunge.* . 386
nepalensis, Hort. . 385
nummularia, *Fisch & Mey.* 386
obtusa, Wall. 384, 385
prostrata, Baker. . 386
rosea, Edgw. . . . 385
rotundifolia, *Wall.* 386
rotundifolia, Herb. Str. & Wint. . . 385
Roylei, *Hort.* . . 385
Simondsii, *Hort.* . 386
thymifolia, *Hort.* . 387
vulgaris, *Lindl.* . . 385
Cotyledon, *Linn.* . . 416
amplexicaulis, Heyne. 415
corymbosa, Hb. Rottl. 415
heterophylla, Roxb. 415
hirsuta, Hb. Heyne. 414
laciniata, Roxb. . 415
Oreades, *C. B. C.* . 416
pinnata, Lamk. . . 413
rhizophylla, Roxb. . 413
spathulata, *C. B. Clarke* 416
spinosa, *Linn.* . . 416
Crassula, *Linn.* . . 413
campestris, Harv. & Sond. 412
indica, *Dcne* . . . 413
pharnaceoides, Fisch & Meyer. . . . 412
Schimperi, Fisch & Meyer 412

Page
CRASSULACEÆ . . . 411
Cratægus, *Linn.* . . 383
Clarkei, *H. f.* . . 383
crenulata, *Roxb.* . 384
cuspidata 375
glauca, Wall. . . 383
integrifolia, Herb. Ham. 387
monogyna, Boiss. . 388
Oxyacantha, *Linn.* . 383
Pyracantha, Brand. 384
ribesius, Bertol . . 383
? *Shicola*, Ham. . . 371
Crotalaria, *L.* . . . 65
acicularis, *Ham.* . 68
acuminata, G. Don. 77
affinis, DC. . . . 83
alata, *Hamilt.* . . 69
albida, *Heyne* . . 71
angulosa, Lamk. . 77
anthylloides, Don. . 72
anthylloides, Lam. . 73
Arnottiana, Benth. 78
assamica, *Benth.* . 75
barbata, *Grah.* . . 76
benghalensis, Lamk. 79
bialata, Roxb. . . 69
bifaria, *Linn.* . . 69
bifaria, Wall. . . 69
biflora, *Linn.* . . 66
biflora, Herb. Madr. 71
bracteata, *Roxb.* . 83
brevipes, Champ. . 73
Browni, Reich. . . 84
Burhia, *Hamilt.* . 66
Burmanni, DC. . 75
cærulea, Jacq. . . 77
cæspitosa, Roxb. . 72
calycina, *Shrank.* . 72
Campbellii, Arn. . 81
candicans, W. & A. 79
canescens, Wall. . 68
capitata, *Benth.* . 74
cephalotes, Hb. Madr. 73
chinensis, *Linn.* . 73
chinensis, Lamk. . 81
chinensis, Roxb. . 70
clavata. *W. & A.* . 83
crassifolia, Ham. . 68
crinita, Grah. . . 72
cuneifolia, Schrank. 75
cytisoides, Roxb. . 65
cytisoides, Wight . 83
dichotoma, Roth. . 69
digitata, *Hook.* . . 85
digitata, Wight. . 85
disticha, Zolling . 68
divaricata, Grah. . 81

Page
dubia, *Grah.* . . 73
elegans, Bedd. . . 74
elliptica, *Roxb.* . . 85
epunctata, Dalz. . 71
eriantha, S. & Z. . 73
evolvuloides, *Wight* 68
fenestrata, Bot. Mag. 79
ferruginea, *Grah.* . 68
filiformis, *Wall.* . 66
filipes, *Benth.* . . 66
foliosa, Willd. . . 81
formosa, *Grah.* . . 76
fulva, *Roxb.* . . . 80
genistoides, Willd. . 82
glabrescens, Benth. . 79
globosa, *W. & A.* . 66
globulosa, Wight . 66
Grahamiana, *W. & A.* 85
grandiflora, Zolling 78
grandis, Hort. . . 80
herbacea, Schweig . 83
herniarioides, W. & A. 81
Heyneana, *Grah.* . 78
hirsuta, *Willd.* . . 68
hirsuta, Roxb. . . 70
hirsuta, Wall. . . 68
hirta, *Willd.* . . 70
hirta, Roth. . . . 66
Hookeri, Arn. . . 84
humifusa, *Grah.* . 61
incana, *Linn.* . . 83
juncea, *Linn.* . . 79
Kurzii, *Baker* . . 75
laburnifolia, *Linn.* . 84
laburnoides, Kl. . 84
lævigata, *Lamk.* . 83
lanata, *Bedd.* . . 77
latifolia, Hort. Calc. 84
leioloba, Bartl. . . 68
leptostachya, *Benth.* 78
Leschenaultii, *DC.* . 76
linearis, Hb. Madr. 72
linifolia, *Linn. f.* . 72
linifolia, var. Wall. 72
longipes, *W. & A.* . 76
lunulata, *Heyne* . . 80
lupiniflora, Grah. . 76
lutescens, *Dalz.* . 74
luxurians, Benth. . 81
macrophylla, Wm. . 75
macrophylla, Willd. 229
macropoda, *A. Rich* 83
macrostyla, Don. . 144
madurensis, *Wight* . 79
medicaginea, *Lamk.* 81
medicaginea, DC. . 82
medicaginea, Ham. . 81
melanocarpa, Wall. 72

Page
montana, Heyne . 72
montana, Roxb. . . 71
multiflora, *Benth.* . 69
mysorensis, *Roth.* . 70
nana, *Burm.* . . . 71
neglecta, W. & A. . 81
nepalensis, Link. . 73
neriifolia, *Wall.* . 74
? *nervosa*, Grah. . 153
Notonii, W. & A. . 82
nummularia, Willd. 66
obliqua, Wall. . . 68
obtecta, *Grah.* . . 79
occulta, *Grah.* . . 72
Oldhami, Miq. . . 73
orixensis, *Rottl.* . 83
ovalifolia, Wall. . 70
pallida, *Kl.* . . . 84
paniculata, *Willd.* . 81
parva, Grah. . . . 71
patula, Grah. . . 71
peduncularis, *Grah.* 74
peduncularis, Dalz. 74
pedunculosa, Desv. . 84
peguana, *Benth.* . 77
pellita, Bert. . . 81
pendula, Bert. . . 84
pilosa, Roxb. . . 70
pilosissima, Miq. . 68
pisiformis, Guill. . 84
porrecta, Wall. . . 79
priestleyoides, *Bth.* 74
procumbens, *Roxb.* . 81
procumbens, Roxb. . 81
prostrata, *Roxb.* . 67
prostrata, Wight . 67
pulcherrima, *Roxb.* 80
pulchra, Andr. . . 80
pulchra, DC. . . 80
punctata, Grah. . 71
punctata, Wall. . 72
pusilla, *Heyne* . . 70
quinquefolia, *Linn.* 84
ramosissima, *Roxb.* 80
retusa, *Linn.* . . 75
rhizophylla, Grah. . 72
rigida, *Heyne* . . 82
rostrata, W. & A. . 82
Rothiana, DC. . . 66
Rothii, Spreng. . . 66
Roxburghiana, DC. 72
rubiginosa, *Willd.* . 69
rubiginosa, Roxb. . 69
sagitticaulis, Wall. . 69
salicifolia, *Heyne* . 77
salicifolia, ? Wall. . 72
Saltiana, Andr. . . 84
saxatilis, Zolling. . 72

Page
scabrella, W. & A. . 70
Schimperi, A. Rich. . 83
scoparia, Wall. . . 71
semperflorens, *Vent.* 78
semperflorens, Benth. 78
sericea, *Retz.* . . 75
sericea, Burm. . . 75
sericea, Willd. . . 79
sessiliflora, *Linn.* . 73
sobolifera, Grah. . 71, 72
spartioides, Spreng. 82
speciosa, *Heyne* . . 73
spectabilis, Roth. . 75
stenophylla, Vogel. . 72
stipitata, Grah. . 82, 83
stipulacea, Roxb. . 70
Stocksii, *Benth.* . . 67
striata, *DC.* . . . 84
stricta, Roth. . . 82
stricta, Roxb. . . 72
subperfoliata, *Wt.* . 79
teeta, *Roth.* . . . 72
tenuifolia, Roxb. . 79
tenuis, Wall. . . 71
tetragona, *Roxb.* . 78
tetragona, Wall. . 79
tomentosa, Rottl. . 81
trichophora, *Benth.* 67
triflora, Heyne . . 69
trifoliastrum, *Willd.* 82
trifoliastrum, Wall. 82
triquetra, *Dalzell.* . 71
tuberosa, Hamilt. . 219
umbellata, Wight. . 71
uniflora, Koen. . . 65
vasculosa, *Grah.* . 85
venusta, Wall. . . 73
verrucosa, *Linn.* . 77
vestita, *Baker* . . 67
viminea, Wall. . 72, 79
virgata, Mart. . . 81
virgata, Roxb. . . 82
Walkeri, Arnott. . 78
Wallichiana, W. & A. 78
Wightiana, Grah. . 70
Wightiana, Wall. . 70
Willdenoviana, *DC.* 31
Crudia, *Schreb.* . . 271
zeylanica, *Benth.* . 271
Crypteronia, *Blume* . 573
glabra, *Blume* . . 574
Griffithii, *C. B. C.* . 574
paniculata, Kurz. . 574
pubescens, *Blume* . 574
Cryptotheca apetala, Blume 569
dichotoma, Bl. . . 571
Ctenolepis, *H.f.* . . 629

Page
cerasiformis, *Naud.* 633
Garcini, *Naud.* . . 629
Cubospermum palustre, Lour. 587
CUCUMERINEÆ . . . 604
Cucumis, *Linn.* . . 619
acutangulus, Wall. . 615
africanus, Bot. Reg. 617
Chata, Wall. . . . 620
cicatrisatus, Stocks. 620
Citrullus, DC. . . 621
Colocynthis, Linn. . 621
eriocarpus, Boiss. . 619
flexuosus, Linn. . . 620
Gurmia, Wall. . . 620
Hardwickii, Royle . 620
integrifolius, Roxb. 612
maculatus, Willd. . 620
maderaspatanus, L. 623
maderaspatanus, Roxb. 619
Melo, *Linn.* . . . 620
Melo, Naud. . . . 619
Missionis, Wall. . 609
muricatus, Wall. . 620
prophetarum, *Linn.* 619
pseudo-colocynthis, Royle 619
pubescens, Wall. . 619
sativus, *Linn.* . . 620
trigonus, *Roxb.* . . 619
turbinatus, Roxb. . 619
utilissimus, Roxb. . 620
verrucosus, Hb. Rottl. 623
Cucurbita, *Linn.* . . 621
Camolenga, Wall. . 622
Citrullus, Linn. . . 621
farinosa, Blume . . 616
ficifolia, Wall. . . 608
hispida, Wall. . . 616
Lagenaria, Linn. . 613
maxima, *Duchesne* . 622
maxima, W. & A. . 622
Melopepo, Roxb. . . 622
Melopepo, Wall. . 607
moschata, *Duchesne* 622
Pepo, *DC.* 622
Pepo, Lour. . . . 616
umbellata, Heyne . 616
umbellata, Wall. . 611
CUCURBITACEÆ. . . 604
Cuminum, *Linn.* . . 717
Cyminum, *Linn.* . 718
Cyminum, Wall. . . 717
Cyamopsis, *DC.* . . 92
psoralioides, *DC.* . 92
Cyanitis sylvatica, Reinw. 406

Page
Cyanospermum javanicum, Miq. . . . 220
tomentosum, W. & A. 222
Cydonia, *Tourn.* . . . 368
indica, Spach. . . 369
Sumboshia, Ham. . 369
vulgaris, *Pers.* . . 369
Cylista, *Ait.* 219
albiflora, Bot. Mag. 223
reticulata, Heyne . 220
scariosa, *Ait.* . . 219
suaveolens, Grah. . 220
tomentosa, Roxb. . 223
Cynometra, *Linn.* . . 267
bijuga, Spanog. . . 267
cauliflora, *Linn.* . 268
cauliflora, Wall. . 267
inæquifolia, *A. Gray* 267
mimosoides, *Wall.* . 267
polyandra, *Roxb.* . 268
ramiflora, *Linn.* . 267
travancorica, *Bedd.* 267
Cyrtonema convolvulacea, Rich. . . 627
divergens, Rich. . . 627
Cyrtotropis carnea, Wall. 188
Cyssopetalum javanum, Turcz. 696
Cytisus Cajan, Linn. . 217
flaccidus, Royle . . 63
pseudo-cajan, Jacq. 217
roseus, Camb. . . 64
sericeus, Willd. . . 110

Dalbergia, *Linn. f.* . 230
acaciæfolia, Dalz. . 235
angustifolia, Hassk. 104
arborea, Heyne . . 235
arborea, Willd. . . 240
assamica, *Benth.* . 235
Blumei, Hassk. . . 234
cana, *Grah.* . . . 237
cassioides, Wall. . 237
Championi, *Thwaites* 231
confertifolia, *Benth.* 233
congesta, *Grah.* . . 232
cultrata, *Grah.* . . 233
emarginata, Roxb. . 231
ferruginea, Hohen. . 234
ferruginea, Roxb. . 237
flexuosa, Grah. . . 238
foliacea, *Wall.* . . 232
frondosa, Roxb. . . 235
frondosa, Wall. . . 234
Gardneriana, Benth. 232
glauca, Wall. . . . 231
glomeriflora, *Kurz.* 236
heterophylla, Willd. 241
hircina, *Benth.* . . 236
hircina, Wall. . . 235
horrida, Grah. . . 238
javanica, Miq. . . 231
Junghuhnii, *Benth.* 233
lanceolaria, *Linn.* . 235
lanceolaria, Moon 252
latifolia, *Roxb.* . . 231
livida, Wall. . 234, 237
marginata, Roxb. . 245
monosperma, *Dalz.* 237
Mooniana, Thwaites 252
multijuga, Grah. . 234
ougeinensis, Roxb. . 161
ovata, *Grah.* . . . 231
paniculata, *Roxb.* . 236
paniculata, Wall. 233, 237
parviflora, Roxb. . 233
pendula, Tenore . 231
pseudo-sissoo, Miq. . 232
purpurea, *Wall.* . 235
reniformis, *Roxb.* . 238
rimosa, *Roxb.* . . 232
robusta, Roxb. . . 241
robusta, Wall. . . 235
rostrata, Grah. . . 237
rubiginosa, *Roxb.* . 232
rufa, Grah. . . . 234
scandens, Roxb. . 240
sissoides, Grah. . . 231
Sissoo, *Roxb.* . . 231
spinosa, *Roxb.* . . 238
stenocarpa, Kurz . 238
stipulacea, *Roxb.* . 237
stipulata, Wall. 233, 238
Stocksii, *Benth.* . . 234
sympathetica, *Nimmo* 234
tamarindifolia, *Roxb.* 234
tephrosioides, W. & A. 105
Thomsoni, *Benth.* . 236
tingens, Wall. . . 237
torta, Grah. . . . 237
velutina, *Benth.* . 233
volubilis, *Roxb.* . . 235
zeylanica, Roxb. . 235
DALBERGIEÆ . . . 60
Dalhousiea, *Grah.* . 248
bracteata, *Grah.* . 248
Dalibarda calycina, DC. 327
Daphnephyllopsis capitata, Kurz . . 747
Dasylonia benghalense, DC. 696
glaucum, DC. . . 696
javanicum, Miq. . 696
latifolium, Lindl. . 696
sub-bipinnatum, Miq. 696
Datisca, *Linn.* . . . 656
cannabina, *Linn.* . 656
nepalensis, Don . . 657
DATISCACEÆ 656
Daucus, *Linn.* . . . 718
Carota, *Linn.* . . 718
Decaspermum, *Forst.* . 469
paniculatum, *Kurz* . 470
paniculatum, Kurz . 462
Dendrolobium cephalotes, Benth. . . 162
umbellatum, Benth. 161
Dendropanax, *Dcne. & Planch.* 733
japonicum, *Seem.* . 733
parviflorum, *Benth.* 733
proteum, Benth. . . 733
Derris, *Lour.* . . . 240
acuminata, Benth. . 247
affinis, Benth. . . 242
amœna, *Benth.* . . 245
brevipes, *Baker* . . 244
canarensis, *Baker* . 246
Crowei, DC. . . . 241
cuneifolia, *Benth.* . 243
dalbergioides, *Baker* 241
discolor, Benth. . . 242
elegans, *Benth.* . . 242
elliptica, *Benth.* . 243
eualata, *Bedd.* . . 244
ferruginea, *Benth.* . 245
Heyneana, *Benth.* . 244
Krowee, Roxb. . . 241
Maingayana, *Baker* 245
marginata, *Benth.* . 245
microptera, *Benth.* . 243
oblonga, *Benth.* . . 242
ovalifolia, Bth. 243, 247
paniculata, *Benth.* . 242
parviflora, *Benth.* . 240
pinnata, Lour. . . 234
platyptera, *Baker* . 245
polystachya, Benth. 247
robusta, *Benth.* . . 241
scandens, *Benth.* . 240
secunda, Baker . . 247
sinuata, *Thwaites* . 246
thrysiflora, *Benth.* . 246
timoriensis, DC. . . 240
uliginosa, *Benth.* . 241
vestita, *Baker* . . 242
Wightii, Baker . . 247
Desmanthus, *Willd.* . 290

Page
Adenanthera, Wall. 286
cinereus, Willd. . . 288
lacustris, DC. . . 285
leptophyllus, DC. . 290
natans, Willd. . . 285
plenus, DC. . . . 286
polyphyllus, DC. . 286
punctatus, DC. . . 286
stolonifer, DC. . . 285
strictus, DC. . . . 290
triquetrus, Willd. . 286
virgatus, Willd. . 290
Desmodium, *Desv.* . 161
abyssinicum, DC. . 166
alatum, DC. . . . 163
amœnum, Wall. . 170
angulatum, DC. . . 167
angulatum, Wall.
144, 171, 172
Aparines, Hassk. . 164
argenteum, Wall. . 168
auricomum, Grah. . 172
auriculatum, DC. . 163
australe, Hassk. . . 162
bambusetorum, Miq. 165
barbatum, Wall. . 167
biarticulatum, *Bth.* 163
bicolor, Wall. . . 164
brachystachyum,
Grah. 171
Buergeri, *Miq.* . . 171
cæspitosum, DC. . . 173
caffrum, E. & Z. . 166
cajanifolium, DC. . 161
capitatum, *DC.* . 170
cateniferum, Arn. . 163
Cephalotes, *Wall.* . 161
collinum, Wall. . . 168
concinnum, *DC.* . . 170
confertum, *DC.* . . 167
congestum, Benth. . 152
congestum, Wall. . 162
dasyphyllum, Miq. . 156
dichotomum, *DC.* . 169
diffusum, *DC.* . . 169
diffusum, DC. . . 164
distans, Royle . . 172
dolabriforme, *Benth.* 165
Dollinera, Endl. . 166
dubium, Lindl. . . 167
elongatum, Wall. . 104
ferrugineum, Wall. . 171
flexuosum, *Wall.* . 168
floribundum, *G. Don* 167
gangeticum, *DC.* . 168
Gardneri, *Benth.* . 165
grande, *Kurz* . . 162
Griffithianum, *Bth.* 171
Page
gyrans, *DC.* 174
gyroides, *DC.* . . 175
gyroides, Hassk. . . 171
heterocarpum, DC. . 171
heterophyllum, *DC.* 173
heterophyllum, Wall. 173
Horsfieldii, Miq. . 156
japonicum, Miq. . 165
jucundum, *Thwaites* 172
laburnifolium, *DC.* . 153
lasiocarpum, DC. . 168
latifolium, *DC.* . . 168
latifolium, Wight . 168
laxiflorum, *DC.* . . 164
laxum, DC. . . . 165
leptostachyum,
Wall. 171
leptostachyum,
Wall. 174
Leschenaultii, DC. . 154
lineatum, Span. . . 162
maculatum, *DC.* . 168
microphyllum, Miq. 174
multiflorum, DC. . 167
nervosum, Vogel . . 171
nutans, Wall. . . 168
obcordatum, *Kurz* . 166
oblatum, *Baker* . . 166
oblongum, *Wall.* . 166
obovatum, Wall. . 170
orbiculatum, Wall. . 170
ormocarpoides, *DC.* 164
ovalifolium, Wall. . 171
oxyphyllum, *DC.* . 167
parviflorum, *Baker* . 172
parvifolium, *DC.* . 174
patens, Wight . . 171
paucinervium, DC. . 170
penduliflorum,
Wall. 170
pendulum, Wall. . 170
podocarpum, *DC.* . 165
podocarpum, Miq. . 165
polycarpum, *DC.* . 171
polycarpum, W. & A. 171
polycarpum, Wall. . 167
præmorsum, Grah.
154, 174
Pryoni, DC. . . . 169
pseudo-triquetrum,
DC. 163
pseudo-gyroides,
Miq. 175
pulchellum, *Benth.* . 162
punctatum, DC. . . 226
quinquangulare, Wt. 169
recurvatum, Grah. . 164
reniforme, *DC.* . . 173
Page
repandum, DC. . . 166
retroflexum, *DC.* . 170
retusum, G. Don . 171
Rottleri, *Baker* . . 174
Rottleri, G. Don . 264
rotundifolium, *Bak.* 172
rotundifolium,
Wall. 170
Roxburghii, Wall. . 169
Roylei, W. & A. . . 175
rufescens, *DC.* . . 171
sambuense, DC. . . 167
Scalpe, *DC.* . . . 165
Schimperi, Hochst. . 166
scoparium, Wall. . 174
scorpiurus, Benth . 164
sequax, *Wall.* . . 170
sericatum, Presl. . 162
serpens, Wall. . . 172
serriferum, Wall. . 167
siliquosum, DC. . . 171
sinuatum, *Blume* . 166
spirale, *DC.* . . . 164
stipulaceum, Hassk. 174
strangulatum, Miq. 166
strangulatum, Thw. 169
strangulatum,
W. & A. . . . 165
sulcatum, Wall. . . 164
tenue, Grah. . . . 172
teres, *Wall.* . . . 164
Thwaitesii, *Baker* . 169
tiliæfolium, *G. Don* 168
trichocaulon, DC. . 172
trichocaulon, Hassk. 165
triflorum, *DC.* . . 173
triflorum, W. & A. . 173
triflorum, Wall. . . 173
trinerve, Grah. . . 165
triquetrum, *DC.* . 163
umbellatum, *DC.* . 161
vestitum, *Benth.* . 162
virgatum, Zolling . 169
viscidum, DC. . . 154
viticinum, Wall . . 163
Walkeri, Arn. . . 169
Wightii, *Grah.* . . 169
Willdenovii, G. Don 169
zonatum, Miq. . . 164
Detarium zeylanicum,
Thwaites . . . 271
Deutzia, *Thunb.* . . 406
Brunoniana, Wall. . 407
corymbosa, *Br.* . . 406
corymbosa, Lindl. . 407
macrantha, *H. f. &*
T. 407
? *parviflora*, Bunge. 406

Page
staminea, *Br.* . . 407
Diacicarpium rotundifolium, Hassk. . 743
tomentosum, Bl. . . 749
Dialium, *Linn.* . . 269
indum, *Linn.* . . . 269
laurinum, *Baker* . 269
Maingayi, *Baker* . 269
ovoideum, *Thwaites* 269
patens, *Baker* . . 270
platysepalum, *Baker* 270
Dicælospermum, *C. B. Clarke* 630
Ritchiei, *C. B. C.* . 630
Dicerma biarticulatum, DC. 163
pulchellum, DC. . . 162
repens, Grah. . . 173
vestitum, Wall. . . 162
Dichotomanthes, *Kurz* 581
Dichroa, *Lour.* . . . 406
cyanitis, Miq. . . 406
febrifuga, *Lour.* . 406
latifolia, Miq. . . 406
Dichrostachys, *DC.* . 288
cinerea, *W. & A.* . 288
Diesingia scandens, Endl. 212
Dillwynia trifoliata, Roth. 63
Dioclea, *H. B. K.* . . 196
Fergusonii, Thw. . 196
javanica, Benth. . 196
lasiocarpa, Mart. . 196
reflexa, *H. f.* . . 196
Diplochonium sesuvioides, Fenzl. . . . 661
Diplocinium biloculare, Wight 650
Arnottianum, Wt. . 641
cordifolium, Wight . 641
Lindleyanum, Wt. . 643
Roxburghii, Miq. . 635
Diplostemon octandrum, Miq. . . . 571
DIPLOZYGIÆ 607
Dipterocarpus cornutus, Dyer 312
Diptoderris, *Benth.* . 244
Discopleura, Benth. . 693
Dissochæta, *Blume* . 543
anceps, Naud. . . 546
annulata, *H. f.* . . 543
astrosticta, Miq. . . 544
bancana, Miq. . . 544
bracteata, *Blume* . 543
bracteosa, Naud. . 543
celebica, *Blume* . . 544
glauca, Blume . . 546
gracilis, *Blume* . . 544
intermedia, *Blume* . 544
microcarpa, Naud. . 544
ovalifolia, Naud. . 544
palembanica, Miq. . 546
pallida, *Blume* . . 544
punctulata, *H. f.* . 543
spoliata, Naud. . . 545
superba, Naud. . . 544
Dissotis Findlaysonii, *Triana* 525
Distylium, *Sieb. & Zucc.* 426
indicum, *Benth.* . . 427
racemosum, *Sieb. & Zucc.* 427
Docynia, *Dcne.* . . 369
Griffithiana, Dcne. . 369
Hookeriana, *Dcne.* . 369
indica, *Dcne.* . . . 369
Dolichos, *Linn.* . . . 209
barbatus, Wall. . . 216
benghalensis, Jacq. . 209
biflorus, *Linn.* . . 210
blandus, Grah. . . 213
bracteatus, *Baker* . 210
bracteatus, Wall. . 225
bulbosus, Linn. . . 207
candicans, Wall. . 226
Catiang, Linn. . . 205
ciliatus, *Klein* . . 210
conspersus, Grah. . 218
coriaceus, Grah. . 196
crassus, Grah. . . 213
Curtisii, *G. Don* . 209
cuspidatus, Grah. . 209
dasycarpus, Miq. . 207
dissectus, Lam. . . 206
elongatus, Grah. . 215
ensiformis, Linn. . 195
fabæformis, L'Herit. 92
falcatus, *Klein* . . 211
fatmensis, Hochst. & Steud. 224
festivus, Wall. . . 209
ficifolius, Grah. . . 199
Finlaysonianus, Grah 218
gangeticus, Roxb. . 205
giganteus, Willd. . 186
gladiatus, Jacq. . . 196
glutinosus, Roxb. . 225
grandifolius, Grah. . 198
Lablab, *Linn.* . . 209
lanceolatus, *Grah.* . 210
lignosus, Linn. . . 209
luteolus, Jacq. . . 205
luteus, Sw. . . . 205
macrodon, Grah. . 225
medicagineus, Lam. 223
medicagineus, Roxb. 216
minimus, Linn. . . 223
monachalis, Brot. . 206
obcordatus, Roxb. . 196
ornatus, Wall. . . 216
ovatus, Grah. . . 211
phaseoloides, Roxb. 199
pilosus, Roxb. . . 207
prostratus, Kœnig. . 210
pruriens, Linn. . . 187
psoraloides, Lamk. . 92
punctatus, W. & A. 218
purpureus, Linn. . 209
reticulatus, Ham. . 213
rhynchosioides, Miq. 218
rotundifolius, Roxb. 196
rufescens, Grah. . 221
scarabæoides, Linn. 215
sinensis, Linn. . . 205
Soja, Linn. . . . 184
spicatus, Wall. . . 198
spicatus, Wall. . . 199
subæqualis, Grah. . 211
subcarnosus, W. & A. 211
suffultus, Grah. . . 212
tetragonolobus, Linn. 211
tomentosus, Roth. . 225
tranquebaricus, Jacq. 205
trilobatus, Linn. . 202
trilobatus, Wall. . 211
truncatus, Miq. . . 218
uniflorus, Lam. . . 210
vestitus, Grah. . . 230
viridis, Ham. . . 199
virosus, Roxb. . . 196
Doodia alopecuroides, Roxb. 156
crinita, Roxb. . . 155
hamosa, Roxb. . . 156
lagopodioides, Roxb. 156
picta, Roxb. . . . 155
Dorema, *H. f. & T.* . 708
Doxomma acuminatum, Miers . . . 509
angustatum, Miers. 509
cylindrostachya, Miers 509
macrostachyum, Miers 509
magnificum, Miers . 509
pendulum, Miers . 509
rigidum, Miers . . 510
sarcostachys, Miers . 509
Dracontomelum, *Bl.* . 43

Page
mangiferum, *Blume*. 43
Drimycarpus, *H. f.* . 36
racemosus, *H. f.* . 36
Drosera, *Linn.* . . . 424
Burmanni, *Vahl*. . 424
Findlaysoniana, Wall. 424
foliosa, H. f. . . 424
gracilis, H. f. . . 424
indica, *Linn.* . . 424
intermedia, W. & A. 425
Lobbiana, *Turcz.* . 424
lunata, Ham. . . 424
peltata, *Sm.* . . . 424
serpens, *Planch.* . 424
DROSERACEÆ . . . 423
Dryadanthe Bungeana, Ledeb. . 346
Dryptopetalum coriaceum, Arn. . 440
membranaceum, Miq. 441
Duabanga, *Ham.* . . 578
sonneratioides, *Ham.* 579
Duchassaingia ovalifolia, Walp. . 189
Duchesnea chrysantha, Miq. 343
fragarioides, Sm. . 343
fragiformis, Don. . 343
sundaica, Miq. . . 359
Dumasia, DC. . . . 182
congesta, Grah. . . 183
cordifolia, *Benth.* . 183
leiocarpa, *Benth.* . 183
pubescens, DC. . . 183
villosa, *DC.* . . . 183
Dunbaria, *W. & A.* . 217
barbata, Benth. . . 216
calycina, Miq. . . 216
circinalis, *Baker* . 219
conspersa, *Benth.* . 218
debilis, *Baker* . . 218
ferruginea, *W. & A.* 217
fusca, Kurz . . . 204
Heynei, *W. & A.* . 217
Horsfieldi, Miq. . 213
latifolia, W. & A. . 217
oblonga, Arn. . . 218
podocarpa, *Kurz* . 218
pulchra, *Benth.* . . 218

Ebenus, *Linn.* . . . 140
ferruginea, J. & Sp. 141
horrida, J. & Sp. . 141
stellata, *Boiss.* . . 140
tragacanthoides, J. & Sp. . . . 140
Echinocalyx, Benth. . 268
Edgaria, *C. B. Clarke* 631
Darjeelingensis, *C. B. Clarke* . . 632
Edwardsia maderaspatana, Wight 249, 251
mollis, Royle . . 251
Elæosticta, *Fenzl.* . 673
meifolia, *Fenzl.* . 673
Eleiotis, *DC.* . . . 153
monophylla, DC. . 153
Rottleri, W. & A. . 174
sororia, *DC.* . . . 153
Ellipanthus, *H. f.* . 55
calophyllus, *Kurz* . 55
Griffithii, *H. f.* . . 56
Helferi, *H. f.* . . 55
Thwaitesii, *H. f.* . 55
tomentosus, *Kurz* . 56
Embelia urophylla, Wall. 312
Embryogonia arborea, Teysm. & Binn. . 446
lucida, Blume . . 454
Enkylia digyna, Griff. 633
trigyna, Griff. . . 633
Entada, *Adans.* . . 286
monostachya, DC. . 287
Parrana, Spreng. . 287
Pursætha, DC. . 287
Pursætha, Scheff. . 287
Rheedei, Spreng. . 287
Rumphii, *Scheff.* . 287
scandens, *Benth.* . 287
Entosiphon, Bedd. . 311
Epilobium, *Linn.* . . 582
alpinum, *Linn.* . . 586
anagallidifolium, *Lamk.* 585
angustifolium, *Linn.* 582
brevifolium, Don . 586
cylindricum, *Don* . 585
fruticosum, Lour. . 587
Gerardianum, Wall. 583
hirsutum, *Linn.* . 583
Hookeri, *C. B. C.* . 585
khasianum, *C. B. Clarke* 585
lætum, *Wall.* . . 584
lætum, Wall. . . 584
latifolium, *Linn.* . 583
laxum, Royle . . 587
montanum, H. f. & T. 585
origanifolium, *Lamk.* 586
palustre, *Linn.* . . 585
parviflorum, *Schreb.* 584
reticulatum, *C. B. Clarke* 583
roseum, *Schreb.* . 584
sericeum, *Benth.* . 584
serratum, Jacq. . . 583
speciosum, Dcne. . 583
spicatum, Lamk. . 583
tetragonum, *Linn.* . 586
tomentosum, Vent. . 584
vestitum, *Benth.* . 584
Eriobotrya, *Lindl.* . 370
angustissima, *H. f.* 372
bengalensis, *H. f.* . 371
dubia, *Dcne.* . . 371
dubia, Dcne. . . 371
elliptica, H. f. & T. 370
elliptica, *Lindl.* . . 372
Hookeriana, *Dcne.* . 371
integrifolia, Kurz . 380
japonica, *Lindl.* . 372
japonica, Wenzig . 372
latifolia, *H. f.* . . 370
longifolia, *H. f.* . 370
macrocarpa, Kurz . 372
petiolata, *H. f.* . . 370
Eriocycla nuda, Lindl. 680
Eriosema, *DC.* . . . 219
chinense, *Vogel* . . 219
Ervum filiforme, Roxb. 177
hirsutum, Linn. . 177
Lens, *Linn.* . . . 179
Lens, Wall. . . . 177
tetraspermum, Linn. 177
Eryngium, *Linn.* . . 669
Billardieri, *Delar.* . 669
cærulescens, Jacq. . 670
cæruleum, *Bieb.* . 669
Kotschyi, Boiss. . 670
planum, Lindl. . . 669
Erythrina, *Linn.* . . 188
alba, *Roxb.* . . . 190
arborescens, *Roxb.* . 190
corallodendron, L. . 188
cuneata, Grah. . . 188
holosericea, Kurz . 190
indica, *Lam.* . . . 188
lithosperma, *Blume* 190
maxima, Roxb. . . 190
monosperma, Lamk. 194
Wahasuta, Ham. . 190
ovaliflora, *Roxb.* . 189
picta, Linn. . . . 189
picta, Wall. . . . 189
reniformis, Ham. . 190
resupinata, *Roxb.* . 189
secundiflora, Hassk. 190
spathacea, Wall. . 188
stricta, *Roxb.* . . 189
suberosa, *Roxb.* . . 189
sublobata, *Roxb.* . 190

Page
sumatrana, Miq. . 190
tomentosa, Ham. . 190
ERYTHRINEÆ . . . 59
Erythropalum populifolium, Mast. . . 600
ESCALLONIEÆ . . . 389
EUCÆSALPINIEÆ . . 60
Euchresta, *Bennett* . 248
Horsfieldii, *Bennett* 248
Eugenia, *Linn.* . . 473
acuminatissima, *Kurz* 483
acutangula, Linn. . 508
alba, Roxb. . . . 474
albiflora, *Duthie* . 479
alternifolia, *Wight* 497
amœna, *Thwaites* . 505
amplexicaulis, *Roxb.* 471
androsæmoides, Bedd. 491
angustifolia, Roxb. 472
anisosepala, *Duthie* 481
aquea, *Burm.* . . 473
areolata, *DC.* . . 490
argentea, *Bedd.* . 503
Arnottiana, *Wight* . 483
assimilis, *Thwaites* . 493
balsamea, *Wight* . 491
Beddomei, *Duthie* . 476
Benthamiana, *Wt.* . 484
bifaria, *Wall.* . . 478
borneensis, Miq. . 484
brachiata, *Roxb.* . 496
bracteata, *Roxb.* . 502
bracteolata, *Wight* . 488
buxifolia, Lam. . . 501
calcadensis, *Bedd.* . 502
calophyllifolia, *Wt.* 494
calyptrata, Roxb. . 499
? *capitellata*, Arn. . 553
caryophyllata, Willd. 506
caryophyllæa, *Wt.* . 460
caryophyllifolia, Lam. 499
cerasiflora, Kurz . 478
cerasoides, Roxb. . 498
chlorantha, *Duthie* . 487
cinerea, Kurz . . 496
claviflora, *Roxb.* . 484
codyensis, *Munro* . 501
colorata, *Duthie* . 492
comosa, Wall. . . 492
concinna, Thwaites . 506
conglomerata, *Duthie* 497
contracta, Wall. . 485
cordifolia, *Wight* . 491
corymbosa, Lam. . 490
corymbosa, Roxb. . 473
corymbosa, Wall. . 487
cotinifolia, Jacq. . 501
crenulata, *Duthie* . 490
cuneata, *Wall.* . . 495
cuneata, Heyne . . 500
cuneata, Wall. . . 485
cuspidata, Wall. . 470
cyclophylla, *Thw.* . 494
cylindrica, *Wight* . 479
cymosa, *Lam.* . . 482
cymosa, Roxb. . . 476
decora, *Thwaites* . 504
decora, Wall. . . 475
densiflora, *DC.* . . 473
diospyrifolia, *Wall.* 472
elliptica, Lam. . . 501
elliptica, Wall. . . 489
expansa, *Wall.* . . 491
fasciculata, Wall. . 502
ferruginea, Wight . 482
ficifolia, *Wall.* . . 476
filiformis, *Wall.* . 478
firma, Wall. . . . 476
floccifera, *Thwaites* 504
floccosa, *Bedd.* . . 501
formosa, *Wall.* . . 471
frondosa, *Wall.* . 490
frondosa, Wall. . . 499
fruticosa, *Roxb.* . 499
fulva, *Thwaites* . . 504
fusiformis, *Duthie* . 479
Gardneri, *Thwaites* 489
glandulifera, Roxb. 485
gracilis, Bedd. . . 505
grandis, Kurz . . 476
grandis, *Wight* . . 475
grata, *Wall.* . . 486
Griffithii, *Duthie* . 481
Helferi, *Duthie* . . 480
hemispherica, *Wt.* . 477
Heyneana, *Wall.* . 500
hypoleuca, Thwaites 501
inophylla, *Roxb.* . 480
insignis, *Thwaites* . 504
Jambolana, *Lam.* . 499
Jambos, *Linn.* . . 474
javanica, *Lamk.* . 474
javanica, Lam. . . 473
Jossinia, *Duthie* . 500
khasiana, *Duthie* . 491
Kurzii, *Duthie* . . 478
læta, *Ham.* . . . 479
lævicaulis, *Duthie* . 492
lanceæfolia, Roxb. . 475
lanceolaria, *Roxb.* . 477
lanceolata, Lam. . . 485
laurifolia, Roxb. . 478
lepidocarpa, *Wall.* . 476
leptantha, *Wight.* . 484
linearis, *Wall.* . . 486
lineata, *Blume* . . 487
lissophylla, *Thwaites* 488
lucida, *Lam.* . . . 501
lucidula, Miq. . . 496
mabæoides, *Wight.* . 505
macrocarpa, *Roxb.* . 474
macrophylla, Lam. . 471
macrosepala, *Duthie* 501
Maingayi, *Duthie* . 484
malabarica, *Bedd.* . 497
malaccensis, *Linn.* . 471
mangifolia, *Wall.* . 480
micrantha, *Thwaites* 483
microcalyx, *Duthie* . 493
microphylla, *Bedd.* . 505
Mooniana, *Wight.* . 505
Mooniana, Wight. . 505
Moorei, F. Muell. . 499
montana, *Wight.* . 488
Munronii, *Wight.* . 472
myrtifolia, *Roxb.* . 483
Neesiana, *Wight.* . 493
nigrescens, Poir. . . 482
nitida, *Duthie* . . 496
oblata, *Roxb.* . . . 492
oblongifolia, *Duthie* 491
obovata, Wall. . . 491
obtusifolia, Roxb. . 500
occlusa, *Miq.* . . . 498
octopetala, Ham. . 482
? *odorata*, Wight. . 496
oligantha, *Thwaites* 494
olivifolia, *Duthie* . 495
operculata, *Roxb.* . 498
pachyphylla, *Kurz* . 477
Paniala, Roxb. . . 498
papillosa, *Duthie* . 495
pauciflora, *Wight.* . 479
pellucida, *Duthie* . 485
pendens, *Duthie* . . 475
penangiana, *Duthie* . 486
polyantha, *Wight.* . 496
polyantha, Wight. . 498
polygama, Roxb. . 470
polypetala, *Wight.* . 472
præcox, Roxb. . . 475
pulchella, Roxb. . 506
purpurea, Roxb. . 472
pustulata, *Duthie* . 495
pyrifolia, *Wall.* . . 487
racemosa, Linn. . . 507
ramosissima, *Wall.* . 480
reticulata, Wight. . 480

Page
revoluta, *Wight.* . 492
rhodomelea, Comm. 482
rivulorum, *Thwaites* 504
rostrata, Bedd. . . 482
Rottleriana, *W. & A.* 502
rotundifolia, *Wight.* 494
Roxburghiana, *Wall.* 475
Roxburghii, *DC.* . 502
rubens, *Roxb.* . . 482
rubicunda, *Wight.* . 495
rubicunda, W. & A. 500
rubricaulis, *Miq.* . 487
rufo-fulva, *Thwaites* 503
salicifolia, Buch. . 472
salicifolia, Grah. . 500
scabrida, Wall. . . 486
sclerophylla, *Thw.* . 494
scoparia, *Wall.* . 489
singampattiana, *Bedd.* 506
skiophila, *Duthie* . 486
spicata, Lam. . . 485
Stocksii, *Duthie* . . 498
subavenis, *Duthie* . 489
subdecussata, *Wall.* 491
sylvestris, *Moon* . 493
tenuis, *Wall.* . . . 500
ternifolia, *Roxb.* . 471
terpnophylla, *Thw.* . 503
tetraëdra, *Miq.* . . 476
tetragona, *Wight.* . 497
Thumra, *Roxb.* . . 481
Thwaitesii, *Duthie* . 506
toddalioides, *Wight.* 482
? *trinervia*, DC. . . 468
tristis, *Kurz* . . . 477
tumida, *Duthie* . . 487
umbrosa, Thwaites . 489
uniflora, *Linn.* . . 505
valdevenosa, *Duthie* 489
venulosa, *Wall.* . . 490
venusta, *Roxb.* . . 488
verecunda, *Wall.* . 496
Wallichii, *Wight.* . 475
Wightiana, *Wight.* . 485
Wightii, Bedd. . . 479
Willdenowii, DC. . 505
Willdenowii, Wight. 502
Wynaadensis, Bedd. 506
xanthocarpa, *Thw.* . 503
zeylanica, *Wight.* . 485
zeylanica, Roxb. . 502
zeylanica, Willd. . 505
EUPHASEOLEÆ . . . 59
Eupteron, Kurz . . . 734
acuminatum, Miq. . 727
Evia amara, Comm. . 42

Page
Ewyckia capitellata, Walp. 551
cyanea, Blume . . 551
Jackiana, Walp. . 551
latifolia, Blume . . 551
medinilliformis, Naud. 551
paniculata, Miq. . 551
tuberculata, Korth. . 553

Falcaria ? diversifolia, DC. 681
Farnesia odora, Gaspar 292
Fatioa nepaulensis, Wall. 575
Ferula, *Linn.* . . . 707
fœtidissima, Regel & Schmalk. . . . 707
Jæschkeana, *Vatke.* 708
Narthex, *Boiss.* . . 707
Thomsoni, *C. B. C.* 708
FICOIDEÆ 658
Flemingia, *Roxb.* . . 226
abrupta, Wall. . . 227
augustifolia, Roxb. . 229
bracteata, Wight. . 227
capitata, Ham. . . 229
capitata, Zolling. . 229
Chappar, *Ham.* . . 227
chlorostachys, Wall. 227
congesta, *Roxb.* . . 228
ferruginea, Wall. . 229
fruticulosa, Wall. . 227
Grahamiana, *W. & A.* 228
involucrata, *Benth.* . 229
latifolia, Benth. . . 229
lineata, *Roxb.* . . 228
nana, Roxb. . . . 229
nana, Wall. . . . 229
paniculata, *Wall.* . 227
Phursia, Ham. . . 227
procumbens, Roxb. . 229
procumbens, Wight. . 230
prostrata, Roxb. . . 229
pycnantha, Benth. . 228
Rothiana, DC. . . 220
semialata, Roxb. . 229
semialata, Wall. . . 229
sericans, Kurz . . 229
stricta, *Roxb.* . . 228
stricta, Wall. . . 229
strobilifera, *R. Br.* . 227
tuberosa, *Dalz.* . . 230
vestita, *Benth.* . . 230
Wallichii, *W. & A.* . 229
Wightiana, Grah. . 229
Fœniculum, *Adans.* . 695
dulce, C. Bauh. . . 695

Page
officinale, Allion . . 695
Panmorium, DC. . 695
piperitum, DC. . . 695
vulgare, *Gærtn.* . 695
Fothergilla involucrata, Falc. . . . 426
Fragaria, *Linn.* . . 343
arguta, Lindl. . . 343
Daltoniana, *J. Gay* 345
elatior, W. & A. . 344
indica, *Andr.* . . . 343
indica, Wall. . . . 346
malayana, Roxb. . 343
nilgerrensis, *Schldl.* 344
nilgerica, Zenker. . 343
nubicola, Lindl. . . 344
Roxburghii, W. & A. 343
sikkimensis, Kurz . 345
vesca, *Linn.* . . . 344

Galactia, *P. Br.* . . 192
filiformis, Wall. . . 192
graminea, Heyne . 192
? oxyphylla, *Benth.* 192
simplicifolia, Dalz. . 191
tenuiflora, *W. & A.* 192
tenuifolia, Wall. . 192
villosa, *W. & A.* . . 192
GALACTIEÆ 59
Galedupa arborea, Roxb. 240
elliptica, Roxb. . . 243
indica, Lam. . . . 240
marginata, Roxb. . 243
Piscidia, Roxb. . . 107
uliginosa, Roxb. . 241
Galega arborescens, Herb. Madr. . . 111
argentea, Lamk. . . 113
Barba-jovis, Burm. . 113
Colonila, Ham. . . 112
Colutea, Burm. . . 95
Colutea, Willd. . . 114
diffusa, Roxb. . . 113
Heyneana, Roxb. . 111
hirta, Ham. . . . 113
incana, Roxb. . . 114
lanceæfolia, Roxb. . 112
maxima, Linn. . . 113
pentaphylla, Roxb. . 113
procumbens, Ham. . 113
purpurea, Linn. . . 112
senticosa, Linn. . . 112
sericea, Ham. . . 112
spinosa, Linn. . . 112
tinctoria, Lamk. . 112
villosa, Linn. . . 113
GALEGEÆ 57

	Page
Gamblea, *C. B. C.*	739
ciliata, *C. B. C.*	739
Gastonia palmata, Roxb.	732
Geissapsis, *W. & A.*	141
cristata, *W. & A.*	141
tenella, *Benth.*	141
Genista versicolor, Wall.	116
Getonia floribunda, Roxb.	449
nitida, Roth.	450
nutans, Roxb.	449
GENISTEÆ	56
Geum, *Linn.*	342
adnatum, Wall.	343
elatum, *Wall.*	343
Roylei, Wall.	342
urbanum, Linn.	342
Gilibertia palmata, DC.	732
Gisekia, *Linn.*	664
linearifolia, Schum.	664
molluginoides, Wt.	664
pharnaceoides, Linn.	664
Glaphyria sericea, Jack.	462
Gleditschia sinensis, Linn.	261
Glinus dictamnoides, Linn.	662
dictamnoides, W. & A.	662
lotoides, Linn.	662
Mollugo, Fenzl.	662
mucronata, Klotzsch	661
parviflora, Wall.	662
trianthemoides, Heyn.	661
Gluta, *Linn.*	21
coarctata, *Griff.*	22
elegans, *Wall.*	22
tavoyana, *Wall.*	22
travancorica, *Bedd.*	22
Glycine, *Linn.*	183
aurea, Willd.	221
cana, Willd.	222
capitata, Heyne	221
cylindriflora, Wall.	182
debilis, DC.	184
densiflora, Roth.	226
elongata, Roth.	221
ferruginea, Grah.	182
flaccida, Wall.	63
flexilis, Grah.	185
Grahami, Wall.	191
involucrata, Wall.	181, 182
javanica, *Linn.*	183
labialis, Linn.	184
leptocarpa, Grah.	63
lucida, Grah.	192
Memnonia, Delile	224
mollis, W. & A.	184
monophylla, Burm.	153
nummularia, Linn.	221
oxyphylla, Grah.	192
pallens, Grah.	184
parviflora, Lam.	184
parviflora, Wall.	184
pentaphylla, *Dalz.*	184
pondicheriensis, Spr.	220
rhombifolia, Willd.	223
rufescens, *Willd.*	220
senegalensis, DC.	184
Soja, *Sieb. & Zucc.*	184
suaveolens, Linn.	222
suffulta, Wall.	182
tenerrima, Grah.	184
tenuiflora, Wall.	192
tenuiflora, Willd.	192
uniflora, Dalz.	210
vestita, Grah.	181
viscida, Willd.	154
warreensis, Dalz.	184
GLYCINEÆ	59
Glycycarpus racemosus, Dalz.	40
Goebelia alopecuroides, Bunge	250
Gomphogyne, *Griff.*	633
cissiformis, *Griff.*	632
heterosperma, *Kurz.*	632
Goniocarpus *micranthus*, Koen. & Sims	430
scaber, Koen. & Sims	431
tetragyna, Labill.	431
Goniogyna hebecarpa, DC.	65
latebrosa, DC.	65
leiocarpa, DC.	65
Gonocarpus micranthus, Thunb.	430
Grislea micropetala, Hochst.	572
punctata, Ham.	572
tomentosa, Roxb.	572
uniflora, Rich.	572
Grona, *Lour.*	191
Dalzellii, *Baker*	191
filicaulis, *Kurz.*	191
Grahami, *Benth.*	191
Guilandina axillaris, Lamk.	258
Bonduc, Linn.	255
Bonduc, W. & A.	254
Bonducella Linn.	254
glabra, Mill.	255
macrocarpa, Grah.	258
Moringa, Linn.	45
Nuga, Linn.	255
Wallichiana, Grah.	268
Guldenstaedtia, *Fisch.*	117
cuneata, Benth.	117
himalaica, *Baker*	117
mirpourensis, *Benth.*	118
multiflora, *Bunge.*	118
Gustavia valida, DC.	511
Gymnopetalum, *Arn.*	611
? calyculatum, *Miq.*	516
cochinchinense, *Kurz*	611
? heterophyllum, *Kurz*	611
Horsfieldii, Miq.	631
integrifolium, *Kurz*	612
piperifolium, Miq.	631
quinquelobum, *Miq.*	611
Wightii, *Arn.*	611
zeylanicum, Arn.	611
Gynostemma, *Blume*	633
cissoides, Bth. & Hk. f.	633
pedata, *Blume*	633
pedata, Bth. & Hk. f.	633
Wightiana, Bth. & Hk. f.	633
Gynotroches, *Blume*	440
axillaris, *Miq.*	440
Dryptopetalum, Blume	440
reticulata, A. Gray	440
GYROCARPEÆ	443
Gyrocarpus, *Jacq.*	461
acuminatus, Meissn.	461
americanus, Jacq.	461
asiaticus, Willd.	461
Jacquini, *Roxb.*	461
rugosus, R. Br.	461
sphenopterus, R. Br.	461
Hallia hirta, Willd.	6[illegible]
sororia, Willd.	15[illegible]
trifoliata, Roth.	220
HALORAGEÆ	430
Haloragis, *Forst.*	430
disticha, Jack.	442
micrantha, *Br.*	430
oligantha, Arn	431
oligantha, W. & A.	431, 433
scabra, Benth.	430
tenella, Brongn.	430
tetragyna, *H. f.*	430
HAMAMELIDEÆ	425
Hamamelis chinensis, Br.	428

Page
Hapalocarpum indicum, Miq. . . . 569
vesicatorium, Miq. . 569
HAPLOZYGIÆ . . . 665
Hardwickia, *Roxb.* . 270
binata, *Roxb.* . . . 270
pinnata, *Roxb.* . . 270
Harlandia bryonioides, Hance. 625
Hedera, *Linn.* . . . 739
aculeata, Don . . 738
acuminata, Wight . 727
æsculifolia, Wall. . 738
? *Aralia*, Jack. . . 732
disperma, DC. . . 738
elata, Ham. . . . 728
emarginata, Moon . 729
exaltata, Thwaites . 730
ferruginea, Wall. . 732
floribunda, Wall. . 737
fragrans, Don. . . 725
glauca, Wall . . . 724
glomerulata, DC. . 737
Hainla, Ham. . . 735
Helix, *Linn.* . . 739
heterophylla, Wall. . 731
Jackiana, G. Don. . 734
japonica, Jungh. . 733
Leschenaultii, W. & A. 724
mollis, Wall. . . . 731
obovata, Wight . . 730
? *ovata*, Wall . . . 734
palmata, Wall . . 732
parasitica, Don. . . 724
parviflora, Champ. . 733
polyacantha, Wall. . 735
racemosa, Wight . 729
rostrata, Wight . . 729
subcordata, Wall. . 724
tomentosa, Ham. . 728
trifoliata, W. & A. 724
undulata, Wall. . 738
venosa, Wall. . . 729
Hederopsis, *C. B. C.* . 739
Maingayi, *C. B. C.* 739
HEDYSAREÆ 58
Hedysarum, *Linn.* . . 145
adhærens, Poir. . . 164
alatum, Roxb. . . 163
Alhagi, Linn. . . 145
alopecuroides, Roxb. 156
arboreum, Don . . 156
arboreum, Roxb. . 161
articulatum, Roxb . 169
astragaloides, *Benth.* 146
biarticulatum, Linn. 163
bijugum, Klein. . . 141

Page
bracteatum, Hb. Mr. 159
bracteatum, Roxb. . 227
bupleurifolium, L. . 158
cachemirianum, *B.* . 146
cajanifolium, H. B. K. 161
capitatum, Burm. . 171
caudatum, Thunb. . 163
Cephalotes, Roxb. . 162
collinum, Roxb. . . 168
conicum, Poir. . . 171
conjugatum, Willd. . 148
crinitum, Linn. . . 155
cylindricum, Poir. . 158
dichotomum, Willd. 169
diffusum, Roxb. . . 164
diffusum, Willd. . 169
diphyllum, Linn. . 147
erinaceum, Poir. . 92
Falconeri, *Baker* . 146
floribundum, Don. . 167
gangeticum, Linn. . 168
Gibsoni, Grah. . . 140
glumaceum, Koen. . 159
gramineum, Retz. . 158
gyrans, Linn. . . 174
gyroides, Roxb. . . 175
hamatum, Burm. . 148
hamatum, Heyne. . 157
hamosum, Roxb. . 156
heterocarpum, Linn. 171
heterophyllum, Willd. 173
junceum, Linn. f. . 142
kumaonense, Benth. 145
laburnifolium, Poir. 163
lagenarium, Roxb. . 152
lagopoides, Burm. . 156
latebrosum, Linn. . 65
latifolium, Roxb. . 169
laxiflorum, *Benth.* . 146
laxum, Spreng. . . 165
leiocarpa, DC. . . 65
lineatum, Linn. . . 228
longifolium, Rottl. . 159
maculatum, Linn. . 168
microcalyx, *Baker* . 147
moniliferum, Linn. . 157
mucronatum, Blume. 161
Neli-Tali, Roxb. . 151
nummularifolium, DC. 140
nummularifolium, Linn. . . . 92, 158
obcordatum, Poir. . 154
orbiculatum, Rottler. 174
ormocarpoides, Desv. 164
patens, Roxb. . . 171

Page
pictum, Jacq. . . . 155
polycarpum, Lam. . 171
prostratum, Linn. . 94
pulchellum, Linn. . 162
punctatum, Rottl. . 226
purpureum, Roxb. . 171
quinquangulatum, Roxb. 169
recurvatum, Roxb. . 164
reniforme, Linn. . . 173
reniforme, Lour. . . 154
reptans, Roxb. . . 173
retroflexum, Linn. . 170
retusum, Don . . . 171
Rottleri, Spreng. . 164
rotundifolium, Vahl. 92
Roxburghii, Spreng. 164
rugosum, Willd. . 159
sambuense, Don. . . 167
sennoides, Willd. . 152
sericeum, Thunb. . 142
sikkimense, *Benth* . 145
siliquosum, Burm. . 171
sororium, Linn. . . 153
sparteum, Burm. . 140
spirale, Schwartz. . 164
stipulaceum, Burm. 173
strobiliferum, *Baker* 146
strobiliferum, Linn. 227
styracifolium, Linn. 170
styracifolium, Roxb. 159
tenellum, Don. . . 174
tiliæfolium, Don. . 168
tomentosum, Thunb. 143
triflorum, Linn. . 173
triquetrum, Linn. . 163
tuberosum, Roxb. . 197
umbellatum, Linn. . 161
umbellatum, Roxb. . 162
vaginale, Linn. . . 158
varium, Roth. . . 153
vespertilionis, Linn. . 154
viscidum, Linn. . . 154
Wallichianum, Spr. 167
Hegetschweilera pulchella, Regel. . . 158
Helosciadium ? Heyneanum, DC. . . . 684
? *pubescens* DC. . . 688
? *tenerum*, DC. . . 686
? *trifoliatum* DC. . 688
Wallichianum, Miq. 688
Helwingia, *Willd.* . . 726
himalaica, *H. f. & T.* 726
populifolia, Spreng. 727
Hemiandrina borneensis, H. f. . . . 47
Henslovia affinis, Pl . 574

Page
glabra, Wall. . . . 574
leptostachys, Planch. 574
pubescens, Wall. . 574
Henslowia affinis, Pl. . 574
Hookeri, Wall. . . 574
pubescens, Griff. . 574
Heptapleurum, *Gtn.* . 727
biternatum, *C. B. C.* 731
capitatum, Seem. 731, 732
Cephalotes, *C. B. C.* 731
elatum, *C. B. C.* . 728
ellipticum, Seem. . 729
emarginatum, *Seem.* 729
exaltatum, Seem. . 730
glaucum, *C. B. C.* . 728
glaucum, Kurz . . 728
heterophyllum, *Seem.* 781
hypoleucum, *Kurz*. 728
impressum, *C. B. C.* 728
khasianum, *C. B. C.* 730
macrophylla *Wall.* . 730
racemosum, *Bedd.* . 729
rostratum, *Bedd.* . 729
stellatum, *Gaertn.* . 730
subulatum, *Seem.* . 730
terebinthacea, Wall. 729
terebinthacea, Vahl. 730
Vahlii, Thwaites . 730
venulosum, *Seem* . 739
Wallichiana, Dalz. & Gibs. 730
Wallichianum, *C. B. Clarke* 730
Wallichianum, Seem. 730
Heracleum, *Linn.* . . 711
absinthifolium, Vent. 717
aquilegifolium, *C. B. Clarke* 715
Brunonis, *Benth.* . 713
burmanicum, *Kurz.* 714
cachemiricum, *C. B. Clarke* 712
candicans, *Wall.* . 714
canescens, *Lindl.* . 713
ceylanicum, *Gardn.* 716
? *cinereum*, Lindl. . 713
concanense, *Dalz.* . 716
diversifolium, Wall. 712
grandiflorum, Dalz. & Gibs. . . . 716
hirsutum, Edgw. . 713
Hookerianum, *W. & A.* 715
Jacquemontii, *C. B. Clarke* 712
nepalense, *Don* . . 714
nubigenum, *C. B. C.* 713

Page
obtusifolium, *Wall.* 714
pedatum, *Wight* . 716
Pinda, *Dalz. & Gibs.* 717
pinnatum, *C. B. C.* 712
rigens, *Wall.* . . 715
Sprengelianum, *W. & A.* 716
Sprengelianum, Dalz. & Gibs. . . . 715
Sprengelianum, Thw. 716
sublineare, *C. B. C.* 713
Thomsonii, *C. B. C.* 711
tomentosum, Dalz. & Gibs. 689
tomentosum, Smith. 717
tragoides, Benth. . 712
Wallichii, *DC.* . . 712
Herpetospermum, *Wall.* 613
caudigerum, *Wall.* . 613
Heteroloma, Benth. . 168
Heteropanax, *Seem.* . 734
fragrans, *Seem.* . . 734
HETEROSCIADIÆ . . 665
Heylandia, *DC.* . . 64
cordifolia, Grah. . 93
hebecarpa, DC. . . 65
latebrosa, *DC.* . . 65
leiocarpa, DC. . . 65
Hippuris, *Linn.* . . 432
vulgaris, *Linn.* . . 432
Hiptage, Wall. . . . 448
Hiræa Finlaysoniana, Wall. Cat. 462, 470
Hodgsoniana, *H. f. & T.* 606
heteroclita, *H. f. & T.* 606
Holigarna, *Ham.* . . 36
albicans, *H. f.* . . 38
Arnottiana, *H. f.* . 36
Beddomei, *H. f.* . 38
ferruginea, *March.* . 37
Grahamii, *H. f.* . 37
Grahamii, Kurz . 38
Helferi, *H. f.* . . 37
longifolia, *Roxb.* . 37
longifolia, Wt. & Arn. 36
racemosa, Roxb. . 36
Homalium, *Jacq.* . . 595
fœtidum, *Benth.* . 597
fœtidum, Kurz . . 598
fœtidum, Benth. . 597
grandiflorum, *Benth.* 598
Griffithianum, *Kurz* 597
longifolium, *Benth.* 596
longifolium, Benth. 597
minutiflorum, *Kurz* 596
nepalense, *Benth.* . 596
propinquum, *C. B. C.* 597

Page
Schlichii, *Kurz* . . 597
tomentosum, *Benth.* 596
travancoricum, *Bedd.* 598
zeylanicum, *Benth.* 596
Homocentria vagans, Naud. 526
Hosackia indica, Grah. 63
Humboldtia, *Vahl.* . 273
Brunonis, *Wall.* . 274
laurifolia, *Vahl.* . 273
unijuga, *Bedd.* . . 274
Vahliana, *Wight* . 274
Hydrangea, *Linn.* . . 403
altissima, *Wall.* . 404
anomala, Don . . 405
aspera, *Don* . . . 404
cyanema, Nutt. . . 404
heteromalla, Don . 405
khasiana, H. f. & T. 405
robusta, *H. f. & T.* 404
scandens, Maxim. . 404
stylosa, *H. f. & T.* 405
vestita, *Wall.* . . 405
vestita, Wall. . . 404
HYDRANGEÆ . . . 388
Hydrilla verticillata, Richard . . . 432
Hydrocotyle, *Linn.* . 667
asiatica, *Linn.* . . 669
burmannica, *Kurz* . 668
conferta, *Wight* . 668
densiflora, DC. . . 668
Heyneana, Wall. . 667
hirsuta, Blume . . 667
hirta, R. Br. . . . 667
hispida, Don . . 667
javanica, *Thunb.* . 667
laxiflora, DC. . . 668
lurida, Hance. . . 669
nepalensis, Hook. . 667
nitidula, A. Richd. 668
perexigua, Hance . 668
podantha, *Molkenb.* 668
polycephala, W. & A. 667
puncticulata, Miq. . 668
ranunculoides, Bl. . 668
rotundiflora, *Roxb.* 668
sibthorpioides, Lam. 669
strigosa, Ham. . . 667
tenella, Don . . . 668
Wightiana, Wall. . 669
zeylanica, DC. . . 667
Zollingeri, Molkenb. 668
Hydrolythrum, *H. f.* . 571
Wallichii, *H. f.* . . 572
Hymenolæna angelicoides, DC. . . 703
Benthami, DC. . . 703

Page
Brunonis, DC. . . 706
Brunonis, Lindl. . 706
Candollii, Benth. . 703
? densiflorum, Lindl. 706
dentata, DC. . . . 704
Govaniana, DC. . 702
latifolia, Lindl. . 703
Lindleyana, Kl. . 705
nana, Ost.-Sack. . 705
obtusiuscula, DC. . 673
pimpinellifolia,
Ost.-Sack. . . . 703
pumila, DC. . . . 704
rotundata, DC. . . 703
stellata, Lindl. . . 705
? suaveolens, Kl. . 706
Hyperanthera decandra,
Willd. 45
Moringa, Vahl. . 45
Hypericinea angustata,
Wall. 24
lucida, Wall. . . 24
micrantha, Wall. . 466
pimentifolia, Wall. 466
Hypobrichia Spruceana,
Benth. 568

Ilex daphnephylloides,
Kurz 747
Illigera, *Blume* . . 460
appendiculata, Bl. . 460
Coryzadenia, *Meissn.* 460
khasiana, *C. B. C.* . 461
Kurzii, *C. B. Clarke* 460
obtusa, Meissn. . . 461
Indigastrum deflexum,
Jaub. & Spach. . 97
Indigofera, *Linn.* . . 92
adenophylla, Grah. 96
æruginis, Schweinf. 94
anabaptista, *Steud.* 102
anceps, Vahl. . . 98
angulosa, Edgw. . 97
arborea, Roxb. . . 101
arcuata, Willd. . . 96
argentea, *Linn.* . . 98
argentea, Roxb . . 97
argentea, Wall. . . 96
armata, Wall. . . 96
articulata, Gouan. 98
aspalathifolia, Roxb. 94
aspalathoides, *Vahl.* 94
asperifolia, Hochst. 94
atropurpurea, *Ham.* 101
brachycarpa, Grah. 99
bracteata, *Grah.* . 100
Brunoniana, *Grah.* 93
cærulea, Roxb. . . 99

Page
cæspitosa, Wight . 94
caloneura, *Kurz* . 93
canescens, Grah. . 96
canescens, Lamk. . 96
capitata, Grah. . 81
cassioides, Rottler. . 101
cinerea, Willd. . . 96
congesta, Grah. . . 96
cordifolia, *Heyne* . 93
cylindracea, *Wall.* . 99
debilis, Grah. . . 98
desmodioides, Benth. 153
Dosua, *Hamilt.* . . 102
Dosua, Wall. . . 100
echinata, *Willd.* . 92
elliptica, Roxb. . 101
endecaphylla, *Jacq.* 98
enneaphylla, *Linn.* 94
ferruginea, Schum. . 98
Finlaysoniana,
Wall. 100
flaccida, Kœnig. . 97
flexuosa, Grah. . . 113
foliolosa, Grah. . . 99
fragrans, Retz. . . 95
frumentacea, Roxb. 94
fusca, G. Don . . 98
galegoides, *DC.* . 100
glabra, Linn. . . 95
Gerardiana, *Wall.* . 100
Gibsonii, Grah. . . 101
glandulosa, *Willd.* . 94
glauca, Lamk. . . 98
glaucescens, Grah. . 101
glutinosa, Perott. . 95
glutinosa, Roxb. . 95
graveolens, Roxb. . 95
Hamiltonii, Grah. . 101
hebepetala, *Benth.* . 101
hedysaroides, Lamk. 96
heterantha, Wall. 100, 102
heterophylla, Roxb. 97
hirsuta, *Linn.* . . 98
Hochstetteri, Baker 102
inamœna, Thwaites 99
indica, Lamk. . . 99
Jirahulia, Hamilt. . 101
Kleinii, W. & A. . 98
lateritia, Willd. . 95
leptostachya, DC. . 100
Leschenaultii, DC. . 96
linearis, Guill. . . 97
linifolia, *Retz.* . . 92
marginulata, Grah. 97
moluccana, DC. . 96
mucronata, *Spreng.* 97
multicaulis, DC. . 96
mysorensis, *Rottl.* . 102

Page
orixensis, Roxb. . 96
ornithopodoides,
Hochst. . . . 102
parviflora, *Heyne* . 97
pauciflora, *Delile* . 97
pedicellata, *W. & A.* 95
pentaphylla, *Linn.* 95
peregrina, DC. . . 96
polyphylla, DC. . . 100
polyphylla, Heyne . 102
polyphylla, Rottler 99
prostrata, Roxb. . 92
prostrata, Willd. . 96
pulchella, *Roxb.* . 101
purpurascens, Roxb. 101
pusilla, Lamk. . . 98
quadrangularis, Gr. 100
retusa, Grah. . . 99
rigida, Willd. . . 96
scabra, Roth. . . 97
Schimperiana, Hoch. 98
semitrijuga, *Forsk.* 98
stachyodes, Lindl. . 102
subulata, *Vahl.* . . 96
sumatrana, Gærtn. . 99
tenuifolia, Rottl. . 95
ternata, Roxb. . . 96
Thonningii, Thonn. 97
timoriensis, Willd. 96
tinctoria, *Linn.* . . 99
tinctoria, DC. . . 99
tinctoria, Forsk. . . 98
tomentosa, Grah. . 102
trifoliata, *Linn.* . 96
trigonelloides,
Jaub. & Spach. . 94
triquetra, *Dalz.* . 93
trita, *Linn.* . . . 96
uncinata, Roxb. . 100
uniflora, *Hamilt.* . 94
verrucosa, Grah. . 101
vestita, Baker . . 96
violacea, Roxb. . . 101
virgata, DC. . . 96
virgata, Roxb. 100, 102
viscosa, *Lamk.* . . 95
Wightii, *Grah.* . . 99
Zollingeriana, Miq. 100
Inga, *Willd.* . . . 306
acutangula, Grah. . 306
annularis, Grah. . 303
attenuata, Grah. . 305
bigemina, Willd. . 303
bubalina, Jack. . . 304
bubalina, Wall. . . 304
Clypearia, Jack. . 305
Clypearia, Wall. . 304
contorta, Grah. . . 305

Page
corcondiana, DC. . 303
cynometroides, *Bedd.* 306
dimidiata, Hk. & A. 305
dolabriformis, Grah. 286
dulcis, Willd. . . 302
Finlaysonia, Grah. 305
Finlaysoniana, Wall. 301
flexuosa, Grah. . . 303
geminata, W. & A. 303
grandiflora, Wall. . 301
Jiringa, Wall. . . 304
Kœnigii, W. & A. . 303
lignosa, Grah. . . 286
lobata, Grah. . . . 305
lucida, Wall. 299, 303
subfalcata, Zoll. . . 306
umbellata, Willd. . 303
umbrosa, Wall. . . 302
ventricosa, Grah. . 301
Wightiana, Grah. . 303
Xylocarpa, DC. . . 286
Intsia coriacea, Maingay 275
palembanica, Miq. . 275
Involucraria Wallichii, Seringe 607
Irina integerrima, Bl. . 7
Itea, *Linn.* 407
chinensis, *Hk. & A.* 408
fragrans, Wall. . . 409
macrophylla, *Wall.* . 408
nutans, *Royle* . . 408

Jambolifera pedunculata, Gaertn . . 500
Jambosa acuminatissima, Hassk. . . 483
æmula, Blume . . 472
alba, Miq. . . 471, 473
alba, Rumph . . . 474
amplexicaulis, DC. . 471
aquea, DC. . . . 473
bifaria Miq. . . . 478
bracteata, Miq. . . 485
coarctata, Blume . 474
conferta, Korth . . 480
cylindrica, Thwaites 480
densiflora, Korth . 473
domestica, Blume . 472
domestica, Rumph . 471
firma, Blume . . . 476
formosa, Walp. . . 471
glabrata, DC. . . 480
grandis, Blume . . 476
inophylla, Miq. . . 481
læta, Blume . . . 479
laurifolia, DC. . . 478
lineata, DC. . . . 487
Page
macrocarpa, Miq. . 474
macrophylla, DC. . 475
madagascariensis, Blume 473
malaccensis, DC. . 471
mappacea, Korth . 471
media, Korth . . 472
nigra, Rumph . . 472
pauciflora, Dalz. & Gibs. 479
pulchella, Miq. . . 492
purpurascens, DC. . 471
purpurea, Wall. . . 472
samarangensis, Bl. . 473
samarangensis, DC. 474
sylvestris alba, Rumph 471
tenuicuspis, Miq. . 482
Teysmanni, Miq. . 480
vulgaris, DC. . . 474
urceolata, Korth . 476
Wightiana, Blume . 482
Johnia congesta, Dalz. & Gibs. . . . 210
Wightii, W. & A. . 183
Johrenia alpina, Fenzl. 605
Jonesia Asoca, Roxb. . 271
pinnata, Willd. . . 271
scandens, Roxb. . 272
triandra, Roxb. . . 272
Jossinia *indica*, W. . 500
lucida, DC. . . . 501
Juglans Catappa, Lour. 444
Jussiæa, *Linn.* 587
angustifolia, Lamk. 587
Burmanni, DC. . . 587
decumbens, Wall. . 587
diffusa, Forsk. . . 587
exaltata, Roxb. . . 587
floribunda, Griff. . 597
fluviatilis, Blume . 587
fruticosa, DC. . . 587
longipes, Griff. . . 587
octophila, DC. . . 587
repens, *Linn.* . . 587
scabra, Willd. . . 587
suffruticosa, *Linn.* . 587
Swarziana, DC. . . 587
villosa, Lamk. . . 587

Kalanchoe, *Adans.* . 414
acutiflora, *Haw.* . . 416
acutiflora, Kurz . 414
brasiliensis, *Camb.* 415
crenata, Oliv. . . 414
crenata, Oliv. . . 415
floribunda, *W. & A.* 414
Page
floribunda, Thwaites 415
glandulosa, *Hochst.* 414
grandiflora, *W. & A.* 415
heterophylla, Hb. W. 414
laciniata, *DC.* . . 415
nudicaulis, Ham. . 414
pinnata, Pers. . . 413
Ritchieana, Dalz. . 414
spathulata, *DC.* . 414
spathulata, Wall. . 415
teretifolia, *Wall.* . 416
teretifolia, Haw. . 415
varians, Haw. . . 414
Wightiana, Wall. . 415
Kandelia, *W & A.* . 437
Rheedii, *W. & A.* . 437
Kanilia caryophylloides, Blume . . 438
parviflora, Blume . 438
Karivia javanica, Miq. 623
Rheedii, Roem. . . 625
samoensis, A. Gray . 624
umbellata, Arn. . . 625
Kendrickia, *H. f.* . . 526
Walkeri, *H. f.* . . 526
Keyserlingia, Bunge . 251
Kibessia, *DC.* . . . 552
acuminata, *Dcne.* . 552
cupularis, Dcne. . 552
pubescens, *Dcne.* . 552
simplex, *Korth.* . . 552
tuberculata, *H. f.* . 553
Kiesera sericea, Reinw. 111
Kurrimia?, Wall. . . 408

Lablab cultratus, DC. 209
leucocarpus, DC. . 209
lignosus, Grah. . . 209
microcarpus, DC. . 209
nankinensis, DC. . 209
perennans, DC. . . 209
vulgaris, Savi . . 209
Lachnopodium rubrolimbatum, Blume 523
Lagenaria, *Seringe* . 613
hispida, Seringe . . 613
idolatrica, Seringe 612
vittata, Seringe . . 613
vulgaris, *Seringe* . 613
Lagerstrœmia, *Linn.* . 575
calyculata, *Kurz* . 576
cuspidata, *Wall.* . 577
elegans, Wall. . . 575
Fatioi, Blume . . 575
floribunda, *Jack* . 577
Flos-Reginæ, *Retz* . 577
grandiflora, Roxb . 579

Page

hexaptera, *Miq.* . . 577
hirsuta, Rottl. . . 476
hypoleuca, *Kurz* . 577
indica, *Linn.* . . 575
lanceolata, *Wall.* . 576
lanceolata, Bedd. . 575
macrocarpa, Wall. . 577
microcarpa, Wight . 576
parviflora, *Roxb.* . 575
pubescens, Wall. . 578
Reginæ, Roxb. . . 577
Rottleri, *C. B. C.* . 576
tomentosa, *Presl.* . 578
venusta, *Wall.* . . 576
villosa, *Wall.* . . 578
Lagonychium Stephanianum, M. Bieb. 288
Laserpitium, Wall. . 695
? coniifolium, Wall. 700
striatum, Wall. . . 699
Lasiobema anguina, Miq. 284
Horsfieldii, Miq. . 284
Lathyrus, *Linn.* . . 179
altaicus, *Led.* . . 180
angulatus, Benth. . 180
Aphaca, *Linn.* . . 179
cashmericus, Royle . 180
erectus, Lag. . . . 180
himalensis, Camb. . 178
inconspicuus, *Linn.* 180
luteus, *Baker* . . 180
ovatus, Royle . . 180
pratensis, *Linn.* . 180
sativus, *Linn.* . . 179
sphæricus, *Retz.* . 180
tingitanus, Linn. . 180
Lawsonia, *Linn.* . . 573
alba, *Lamk.* . . . 573
inermis, Roxb. . . 573
purpurea, Lamk. . 573
spinosa, Linn. . . 573
LECYTHIDEÆ . . . 463
LEGNOTIDEÆ . . . 435
LEGUMINOSÆ . . . 56
Leucymmæa, Presl. . 512
Leobordea lotoides, Del. 64
Lepidocoma trifoliatum, Jungh. . . 229
Leptodesmia, *Benth.* . 152
congesta, *Benth.* . 152
Leptospartion grandiflorum, Griff. . . 579
LEPTOSPERMEÆ . . . 462
Leptospermum, *Forst.* 464
amboinense, *Blume* . 464
flavescens, Sm. . . 464
floribundum, Jungh. 464

javanicum, *Blume* . 464
scabrum, Wall. . 407
stamineum, Wall. . 407
Lespedeza, *Mich.* . . 142
argyræa, Sieb. . . 142
cuneata, G. Don . . 142
decora, *Kurz* . . . 144
elegans, *Camb.* . . 143
elliptica, *Benth.* . 143
eriocarpa, *DC.* . . 144
Gerardiana, *Grah.* . 142
glomerata, Horn. . 143
glomerata, Hornem . 143
hirta, Elliott . . . 143
indica, Spreng. . . 220
involucrata, Wall. . 229
juncea, *Pers.* . . . 142
juncea, Wall. . 94, 142
kanaorensis, Camb. 142
lagopoides, Pers. . 156
lineata, Pers. . . 228
macrostyla, *Baker* . 143
paniculata, Royle . 144
parviflora, *Kurz* . 144
pinetorum, *Kurz* . 143
Royleana, Miq. . . 144
sericea, *Miq.* . . . 142
sericea, Royle . . 144
Thomsoni, *Benth.* . 144
tomentosa, *Sieb.* . 143
variegata, Camb. . 142
Leucæna, *Benth.* . . 290
glauca, *Benth.* . . 290
Leucodictyon malvensis, Dalz. & Gibs. 192
? *Levisticum argutum*, Lindl. 699
Ligusticum, *Linn.* . . 698
Ajawain, Fleming . 682
Ajouan, *Roxb.* . . 682
angelicoides, Wall. . 703
Benthami, Wall. . 703
Brunonis, Wall. . 706
Candollii, Wall. . 703
coniifolium, DC. . 700
dentatum, Wall. . 704
diffusum, Roxb. . . 693
elatum, *C. B. C.* . 698
Govanianum, Wall. 702
indicum, Wall. . . 693
marginatum, *C. B. Clarke* 698
? *meoides*, Jacquem. 671
? *nepalense*, Don. . 720
obtusiusculum, Wall. 673
pumilum, Wall. . . 704
rotundatum, Wal. . 703
Thomsoni, *C. B. C.* 698

Limeum, *Linn.* . . . 664
indicum, *Stocks* . . 664
Liquidambar Altingia, Blume 429
Altingiana, Blume . 429
tricuspis, Miq. . . 429
Loropetalum, *Br.* . . 428
chinense, *Oliv.* . . 428
LOTEÆ 57
Lotononis, *DC.* . . . 64
Leobordea, *Benth.* . 64
Lotus, *Linn.* . . . 91
bracteatus, Wall. . 91
corniculatus, *Linn.* 91
Garcini, *DC.* . . 91
indicus, Desv. . . 63
major, *Scop.* . . 91
Stocksii, Boiss. . . 91
Lourea, *Neck.* . . . 154
campanulata, *Benth.* 155
microphylla, Wall. . 154
obcordata, *Desv.* . 154
paniculata, *Wall.* . 154
reniformis, DC. . . 154
vespertilionis, *Desv.* 154
Ludia fœtida, Roxb. . 598
Ludwigia, *Linn.* . . 588
diffusa, Ham. . . 588
fruticulosa, Blume . 588
jussiæoides, Wall . 588
lythroides, Blume . 588
parviflora, *Roxb.* . 588
prostrata, *Roxb.* . 588
Luffa, *Cav.* 614
acutangula, *Roxb.* . 615
acutangula, W. & A. 614
ægyptica, *Mill.* . . 614
amara, *Roxb.* . . . 615
amara, Wall. . . . 618
Bindaal, Roxb. . . 615
Cattu-picinna, Ser. . 614
clavata, Roxb. . . 614
cylindrica, Roem. . 614
echinata, *Roxb.* . . 615
Goza, Wall. . . . 614
graveolens, *Roxb.* . 614
hederacea, Wall. . . 614
Kleinii, *W. & A.* . 616
longistylis, *Edgw.* . 615
Parvala, Wall. . . 614
pentandra, Roxb. . 614
Petola, Seringe . . 614
Plukenetiana, DC. . 615
racemosa, Roxb. . . 614
Satpatia, Wall. . . 614
tuberosa, Roxb. . . 618
umbellata, Roem. . 616
Lumnitzera, *Willd.* . 451

	Page
coccinea, *W. & A.*	452
littorea, Voigt.	452
pentandra, Griff.	452
racemosa, *Willd.*	452
Lupinus cochinchinensis, Lour.	75
trifoliatus, Cav.	92
trifoliatus, Rottl.	82
LYTHREÆ	565
LYTHRACEÆ	565
Lythrum fruticosum, Linn.	572
Pemphis, Linn. f.	573
Macklottia amboinensis, Korth.	464
javanica, Korth.	464
Maclellandia Griffithiana, Wight	573
Macrolobium bijugum, Coleb.	275
Macronyx strigosus, Dalz.	111
Macropanax, *Miq.*	738
floribundum, Miq.	738
glomerulatum, Miq.	737
oreophilum, *Miq.*	738
undulatum, *Seem.*	738
Macrotropis bancana, Miq.	254
sumatrana, Miq.	253
Maddenia, *H. f. & T.*	317
himalaica, *H. f. & T.*	318
pedicellata, *H. f.*	318
Maingaya, *Oliv.*	428
malayana, *Oliv.*	428
Malus communis, Desv.	373
baccata, Desv.	373
Mammea asiatica, L.	507
Mangifera, *Linn.*	13
axillaris, Lamk.	23
cæsia, *Jack.*	19
caloneura, *Kurz*	14
domestica, Gærtn.	14
fœtida, *Lour.*	18
fœtida, Blume	19
fœtida, Miquel	17
fragrans, *Maingay*	18
gracilipes, *H. f.*	16
Griffithii, *H. f.*	14
Horsfieldii, Miq.	19
indica, *Linn.*	13
indica, Thwaites	16
indica, Wall.	15
lagenifera, *Griff.*	18
longipes, *Griff.*	15
Maingayi, *H. f.*	17
microphylla, *Griff.*	17
oblongifolia, *H. f.*	16
odorata, *Griff.*	17
oppositifolia, Roxb.	21
pentandra, *H. f.*	14
pinnata, Koen.	42
policarpa, *Griff.*	20
quadrifida, *Jack.*	16
sclerophylla, *H. f.*	15
superba, *H. f.*	19
sylvatica, *Roxb.*	15
zeylanica, *H. f.*	16
Manna hebraica, Don	145
nepalensis, Don	145
Maranthes multiflora, Korth.	310
Marlea, *Roxb.*	742
affinis, Dcne	743
alpina, *H. f. & T.*	744
barbata, *R. Br.*	743
begoniæfolia, *Roxb.*	743
ebenacea, *C. B. C.*	742
Griffithii, *C. B. C.*	742
nobilis, *C. B. C.*	743
tomentosa, Endl.	743
Marumia, *Blume*	541
affinis, Korth	542
echinulata, Naud.	542
nemorosa, *Blume*	542
oligantha, Naud.	542
reticulata, *Blume*	542
stellulata, Korth	542
zeylanica, *Blume*	542
Mastersia, *Benth.*	195
cleistocarpa, *Baker*	195
Mastixia, *Bl.*	745
arborea, *C. B. C.*	745
bracteata, *C. B. C.*	746
cuspidata, Bl.	746
Junghuhniana, *C. B. Clarke*	746
Maingayi, *C. B. C.*	746
pentandra, *Bl.*	746
tetrandra, *C. B. C.*	745
trichotoma, Bl.	746
Mecopus, *Bennett*	160
nidulans, *Bennett*	160
Medicago, *Linn.*	89
canescens, Grah.	90
denticulata, *Willd.*	90
falcata, *Linn.*	90
laciniata, *All.*	90
lupulina, *Linn.*	90
minima, *Lamk.*	91
orbicularis, *All.*	90
polymorpha, Roxb.	90
procumbens, Besser.	90
sativa, *Linn.*	90
sativa, Wall.	90
Medinilla, *Gaud.*	546
Beddomei, *C. B. C.*	548
crassifolia, Triana	547
erythrophylla, Ldl.	587
erythrophyllum, Wall.	547
fuchsioides, *Gardn.*	548
Griffithii, C. B. C.	549
Hasseltii, *Blume*	547
himalayana, *H. f.*	549
macrocarpa, *Blume*	547
maculata, *Gardn.*	548
Maingayi, C. B. C.	549
malabarica, *Bedd.*	548
merguiensis, C. B. Clarke	549
pauciflora, *H. f.*	549
radicans, Bedd.	548
rosea, *Gaud.*	547
rubicunda, *Blume*	547
speciosa, *Blume*	549
? *Walkeri*, Wight	526
MEDINILLEÆ	513
Melaleuca, *Linn.*	464
Cajuputi, Roxb.	465
Cumingiana, Turcz.	465
decurrens, Wall.	467
eugenifolia, Wall.	467
lancifolia, Turcz.	465
Leucadendron, *Linn.*	465
Leucadendron, Lam.	465
minor, *Sm.*	465
saligna, Blume	465
viridiflora, Gærtn.	465
Melanium fruticosum, Spreng.	578
Melanochyla, *H. f.*	38
angustifolia, *H. f.*	39
auriculata, *H. f.*	39
Maingayi, *H. f.*	39
tomentosa, *H. f.*	38
Melanorrhœa, *Wall.*	25
glabra, *Wall.*	25
Maingayi, *H. f.*	25
usitata, *Wall.*	25
Wallichii, *H. f.*	25
Melastoma, *Linn.*	523
annulatum, Wall.	546
anoplanthum, Naud.	523
asperum, Linn.	519
? *barbatum*, Wall.	546
brachyodon, Naud.	524
bracteatum, Jack.	543
bracteatum, Wall.	543
cernua, Roxb.	526
cernuum, Wall.	545
crinita, Roxb.	517
crinitum, Naud.	524

Page
curva, Roxb. . . . 525
cyanoides, DC. . . 522
decemfidum, Jack. . 524
ellipticum, Naud. . 525
exigua, Jack. . . . 527
eximium, Blume . . 549
fallax, Wall. . 544, 545
fasciculare, Naud. . 524
Findlaysonii, Wall. . 525
? *glauca*, Griff. . . 545
glauca, Jack. . . . 546
glaucum, Wall. . . 545
gracile, Jack. . . . 545
Houtteanum, *Naud.* 524
imbricatum, *Wall.* . 524
lanuginosum, *Blume* 525
laurifolium, Wall. . 547
? *littoreum*, Wall. . 528
malabathricum, *L.* . 523
malabathricum, Jack. 524
microphyllum, Naud. 525
moluccanum, *Blume* 522
napalensis, Lodd. . 524
nemorosum, Jack. . 542
normale, *Don* . . 524
? *obvolutum*, Jack. . 523
oxyphyllum, Benth. 528
pallida, Jack. . . 544
petiolare, Wall. . . 545
polyanthum, *Blume* 523
polyanthum, Benth. 546
pulchella, Roxb. . . 518
pulverulentum, Jack. 550
reflexa, Blume, . . 550
rhodocarpum, Wall. 542
rotundifolium, Jack. 541
Royenii, *Blume* . . 525
rubicunda, Jack. . 547
rubicundum, Jack. . 550
rubiginosum, Wall. . 544
rugosa, Roxb. . . 525
sanguineum, *Sims.* . 524
smilacifolia, Wall. . 550
triflorum, Naud. . . 525
vagans, Roxb. . . 526
Wallichii, DC. . . 524
MELASTOMACEÆ . . 512
Melastomeæ . . . 512
Melilotus, *Juss.* . . 89
alba, *Lamk.* . . . 89
altissima, Thuill. . 89
altissima, Wall. . . 89
emodi, Wall. . . . 88
indica, All. . . . 89
leucantha, Koch. . 89
macrorhiza, Pers. . 89
minima, Roth. . . 89
officinalis, *Willd.* . 89

Page
parviflora, *Desf.* . . 89
vulgaris, Willd. . . 89
Meliosma, *Blume* . . 3
acuminata, Royle . 4
Arnottiana, *Wight* . 6
dilleniæfolia, *Wall.* 4
elliptica, *H. f.* . . 5
ferruginea, S. & Z. 4
integrifolia, Wall. . 4, 5
lanceolata, *Blume* . 7
lancifolia, *H. f.* . . 5
nitida, Blume . . 6
pinnata, *Roxb.* . . 6
pungens, *Wall.* . . 4
pungens, Wall. . . 4
rigida, Sieb. & Zucc. 4
simplicifolia, *Roxb.* . 5
sumatrana, *Jack.* . 6
Wallichii, *Planch.* . 6
Wightii, *Planch.* . 4
Melothria, *Linn.* . . 625
bicirrhosa, *C. B. C.* 627
deltoidea, *Thwaites* . 626
fœtida, Lamk. . . 627
indica, *Lour.* . . . 626
odorata, *Hk. f. & T.* 626
Regelii, Naud. . . 626
Wallichii, *C. B. C.* . 626
zeylanica, *C. B. C.* . 626
MEMECYLEÆ . . . 513
Memecylon, *Linn.* . . 553
acuminatum, *Smith* . 562
acuminatum, Wall. . 565
amabile, *Bedd.* . . 555
ambiguum, Blume . 557
Amherstianum, *C. B. Clarke* 557
amplexicaule, *Roxb.* 559
angustifolium, *W.* . 562
Arnottianum, *Thw.* . 553
australe, F. Muell. . 555
cæruleum, *Jack.* . 559
cæruleum, Kurz . . 554
campanulatum, *C. B. Clarke* 563
campongum, Miq. . 554
capitellatum, Heyne 564
capitellatum, Linn. . 564
capitellatum, Thw. . 564
celastrinum, Kurz . 558
cerasiforme, *Kurz* . 557
cordatum, Wall. . 559
costatum, *Miq.* . . 558
cuneata, *Thwaites* . 564
deccanense, *C. B. C.* 560
depressum, Benth. . 559
edule, *Roxb.* . . . 563
edule, Lamk. . . . 563

Page
edule, Roxb. . . . 563
edule, Thw. 557, 563, 564
elegans, *Kurz* . . 554
elegantulum, *Thw.* . 555
ellipticum, *Thwaites* 556
flavescens, *Triana* . 562
floribundum, Wall. . 499
floribundum, Wall. . 564
fuscescens, *Thwaites* 562
garcinioides, Blume 561
Gardneri, *Thwaites* 553
globiferum, Wall. . 563
gracile, *Bedd.* . . 555
grande, *Retz.* . . 557
grande, Blume . . 558
grande, Wall. . . 564
Griffithianum, *Naud.* 554
Griffithianum, Kurz 558
heteropleurum, *Bl.* . 557
Heyneanum, *Benth.* 560
Heyneanum, Wight 560
Hookeri, *Thwaites* . 554
Horsfieldii, *Miq.* . 558
intermedium, *Blume* 561
jambosoides, Wight 560
lævigatum, *Blume* . 561
laxiflorum, Wall. . 557
leucantha, Thwaites 564
lucidum, Presl. . . 564
lutescens, Presl. . 559
macrocarpum, Thw. 556
macrophyllum, *Thw.* 559
Maingayi, *C. B. C.* 557
manillanum, Naud. 559
microstomum, *C. B. Clarke* 557
myrsinoides, Blume 555
myrtifolium, Wall. 564
Myrtilli, Blume . 561
obtusum, Wall. . . 564
orbiculare, *Thwaites* 560
ovatum, Sm. . . . 564
ovoideum, *Thwaites* 556
pachyderma, Wall. . 561
parvifolium, Thw. . 556
pauciflorum, *Blume* 555
pauciflorum, Wall. . 565
phyllanthifolium, *Thwaites* . . . 563
plebejum, *Kurz* . . 561
prasinum, Naud. . 564
procerum, *Thwaites* 556
pulchrum, *Kurz* . 559
punctatum, Presl. . 564
pyrifolium, Naud. . 563
pyrifolium, Presl. . 564
pyriforme, Wall. . 565
revolutum, *Thwaites* 560

Page
rhinophyllum, *Thw.* 562
rostratum, *Thwaites* 562
Royenii, Blume . . 564
rubro-cærulea, *Thw.* 564
scutellatum, Naud. . 564
sessile, Wall. . . 559
sessile, Wall. . . 564
subquadrangulare, DC. 564
subtrinervium, Miq. 565
sylvaticum, *Thwaites* 561
terminale, *Dalz.* . 558
tinctorium, Kœn. . 563
tinctorium, W. & A. 564
umbellatum, Benth. 555
umbellatum, Blume. 561
umbellatum, Burm. 563
umbellatum, Heyne. 564
umbellatum, Thw. . 564
varians, *Thwaites* . 556
Vosmærianum, Scheffer . . . 561
Walkeri, Hook . . 564
Wightianum, Triana 560
Wightii, *Thwaites* . 554
Mespilus acuminata, Lodd. 385
affinis, Don . . . 385
bengalensis, Roxb. . 371
crenulata, Don . . 384
Cuila, Ham. . . 372
japonica, Banks . 372
tinctoria, Don . . 371
Mezierea Griffithiana, A. DC. 644
nepalensis, A. DC. . 643
Mezoneurum, *Desf.* . 257
cucullatum, *W. & A.* 258
enneaphyllum, *W. & A.* . . . 258
glabrum, *Desf.* . . 258
grandis, *Heyne* . . 258
macrophyllum, Bl. . 258
pubescens, *Desf.* . 259
sumatranum, *W. & A.* 259
Micromeles verrucosa, Dcne. 378
Micropteryx stricta, Walp. 189
suberosa, Walp. . 189
sublobata, Walp. . 190
Microtropis coriacea, Wall. 440
Millettia, *Wt. & Arn.* 104
atropurpurea, Benth. 108
auriculata, *Baker* . 108
Brandisiana, *Kurz* 108
Page
cærulea, *Baker* . . 107
cana, *Benth.* . . 105
caudata, *Baker* . . 109
cinerea, *Benth.* . . 106
eriantha, *Benth.* . . 108
extensa, *Benth.* . . 109
fruticosa, *Benth.* . 109
glaucescens, *Kurz* . 107
leiogyna, *Kurz* . . 109
leucantha, Kurz . 105
Maingayi, *Baker* . 110
monticola, *Kurz* . 106
ovalifolia, *Kurz* . 107
pachycarpa, *Benth.* 106
pallida, Dalz. . . 105
pendula, *Benth.* . 105
Piscidia, *Wight* . . 107
pubinervis, *Kurz* . 106
pulchra, *Benth.* . . 104
racemosa, *Benth.* . 105
rubiginosa, *W. & A.* 104
sericea, *W. & A.* . 104
splendens, *W. & A.* 104
tetraptera, *Kurz* . 106
thyrsiflora, Benth. . 246
Millingtonia, Roxb. . 3
simplicifolia, Wall. 4
Mimosa, *Linn.* . . . 291
abstergens, Spreng. 296
Adenanthera, Roxb. 286
agrestis, Sieb. . . 288
alba, Rottl. . . . 294
albida, Roxb. . . 294
amara, Roxb. . . 301
arabica, Lam. . . 293
arborea, Thunb. . 300
armata, Rottl. . . 291
bigemina, Linn. . 303
biglobosa, Roxb. . 289
cæsia, Linn. . . . 297
Catechu, Roxb. . . 295
catechuoides, Roxb. 295
cinerea, Linn. . . 297
concinna, Willd. . 296
concordiana, Roxb. 303
cornigera, Linn. . 296
dulcis, Roxb. . . 302
dumosa, Roxb. . . 296
eburnea, Linn. f. . 293
eburnea, Roxb. . . 293
elata, Roxb. . . . 299
frondosa, Heyne . 294
Farnesiana, Linn. . 292
ferruginea, Rottl. . 297
ferruginea, Roxb. . 295
hamata, *Willd.* . . 291
heterophylla, Roxb. 306
horrida, Sm. . . . 293
Page
Intsia, Linn. . . 297
Jiringa, Jack. . . 305
Kœringa, Roxb. . 305
Kalkora, Roxb. . 300
Kleinii, Poir . . 294
Latronum, Linn. . 296
leucophlæa, Roxb. . 294
lucida, Roxb. 299, 303
marginata, Lam. . 299
microphylla, Roxb. 301
monadelpha, Roxb. 303
mutabilis, Roxb. . 291
natans, Roxb. . . 285
nitida, Vahl. . . 303
obovata, Roxb. . . 296
octandra, Roxb . 291
odoratissima, Linn. 299
pedunculata, Roxb. 289
pennata, Linn. . . 297
procera, Roxb. . . 299
pudica, Linn. . . 291
pulchella, Roxb. . 301
rubicaulis, *Lam.* . 291
Rottleri, Spreng. . 291
rugata, Lam. . . 296
scandens, Linn. . 287
sepiaria, *Benth.* . . 291
Sirissa, Roxb . . 298
Smithiana, Roxb. . 300
speciosa, Jacq. . . 298
spinosisiliqua, Rottl. 291
stipulacea, Roxb. . 300
Suma, Roxb. . . 294
Sundra, Roxb. . . 295
tamariscina, Heyne 294
tenuifolia, Roxb. . 297
tomentosa, Roxb. . 294
torta, Roxb. . . . 297
trapezifolia, Roxb. 305
triquetra, Vahl. . . 286
umbellata, Vahl. . 303
virgata, Linn. . . 290
xylocarpa, DC. . . 286
MIMOSEÆ 61
MIMOSOIDEÆ . . . 266
Mitrosicyos lobatus, Maxim. . . . 633
Modecca, *Lam.* . . . 601
aliena, Wall. . . 603
apiculata. Mast. . 603
cardiophylla, *Mast.* 602
cordifolia, *Blume* . 602
diversifolia, Wall. . 601
furfuracea, Wall. . 603
? *heterophylla*, Kurz. 602
integrifolia, Lam. . 603
integrifolia, Wall. . 603
nicobarica, Kurz . 603

Page

palmata, *Lam.* . . 603
populifolia, Blume 603
singaporeana, *Mast.* 601
trilobata, *Roxb.* . 602
tuberosa, Roxb. . 603
Wightiana, *Wall.* . 601
MODECCEÆ 599
MOLLUGINEÆ . . . 659
Mollugo, *Linn.* . . 662
bellidiflora, *Seringe* 664
Cerviana, *Seringe* . 663
disticha, *Seringe* . 663
Glinus, A. Rich. . 662
hirta, *Thunb.* . . 662
Linkii, Seringe . . 663
lotoides, *W. & A.* . 662
nudicaulis, *Lamk.* . 664
parviflora, DC. . . 562
pentaphylla, Linn. . 663
Spergula, *Linn.* . . 662
stricta, *Linn.* . . 663
triphylla, Lour. . 663
umbellata, Seringe . 663
verticillata, Roxb. . 662
Momordica, *Linn.* . 616
Balsamina, *Linn.* . 617
Balsamina, Wall. . 617
calcarata, Wall. . 631
Charantia, *Linn.* . 616
cochinchinensis, *Spreng.* . . . 618
Cymbalaria, *Fenzl.* 618
denudata, *Thwaites* 618
dioica, Roxb. . . 617
dioica, Wall. . . 618
Hamiltoniana, Wall. 617
Heyneana, Wall. . 617
humilis, Wall. . . 617
Luffa, Linn. . . 614
Missionis, Wall. . 617
mixta, Roxb. . . 618
monadelpha, Roxb. 621
muricata, DC. . . 617
Paina, Wall. . . 633
renigera, Wall. . . 617
senegalensis, Lamk. 617
subangulata, Blume 617
tubiflora, Roxb. . 611
tubiflora, Wall. . 615
umbellata, Roxb. . 625
Wallichii, Roem. . 617
Monoxora spectabilis, Wight 469
Moringa, *Lamk.* . . 45
Concanensis, *Nim.* . 45
oleifera, Lamk. . . 45
polygona, DC. . . 45

Page

pterygosperma, Grtn. 45
zeylanica, Pers. . 45
MORINGEÆ 45
Mucuna, *Adans.* . . 185
acuminata, *Grah.* . 185
anguina, Wall . . 185
atropurpurea, *DC.* . 186
bracteata, *DC.* . . 186
capitata, *W. & A.* . 187
corymbosa, Grah. . 185
cristata, Ham. . . 185
gigantea, *DC.* . . 186
? *gracilis*, Grah. . 193
hirsuta, *W. & A.* . 187
imbricata, *DC.* . . 185
macrocarpa, *Wall.* . 186
monosperma, *DC.* . 185
monosperma, Wall. 185
nigra, Ham. . . 188
nivea, *DC.* . . . 188
pruriens, *DC.* . . 187
prurita, Hook. . . 187
recta, Wall. . . . 207
utilis, Wall. . . . 187
velutina, Hassk. . 187
Mukia, *Arn.* . . . 623
leiosperma, *Thw.* . 623
maderaspatana, Kz. 623
scabrella, *Arn.* . . 623
Mundulea, *DC.* . . 110
pulchra, Benth. . . 105
suberosa, *Benth.* . 110
Muricia cochinchinensis, Lour. . . . 618
Myonima multiflora, Ait. 462
Myriophyllum, *Linn.* 432
indicum, Linn. . . 432
indicum, Griff. . . 432
indicum, Wight . . 433
indicum, *Willd.* . . 433
intermedium, *DC.* . 433
intermedium, Wight 432
lineare, Heyne . . 433
spicatum, *Linn.* . . 433
tetrandrum, Roxb. . 433
tuberculatum, *Roxb.* 432
variæfolium, Hook. 433
verticillatum, *Linn.* 433
Myrobalanus belerica, Gaertn. 445
Chebula, Gaertn. . 446
citrina, Gaertn. . . 446
MYRTACEÆ 462
MYRTEÆ 463
Myrtus acuminatissima, Bl. 483
amboinensis, Rumph. 464

Page

androsæmoides, Poir. 462
bracteata, Willd. . . 502
braziliana, Linn. . 505
canescens, Lour . 469
caryophyllata, Linn. 490
Commersonii, Spr. . 501
communis, L. . . 462
coromandeliana, Kön. 502
cotinifolia, Spreng. 501
Cumini, Linn. . . 499
cymosa, Blume . . 496
cymosa, Spreng. . 482
densiflora, Blume . 473
Heynei, Spreng. . . 502
Jambos, Kunth. . . 474
javanica, Blume . 473
latifolia, Heyne . 502
Leucadendron, Linn. 465
littoralis, Roxb. . . 502
macrophylla, Spreng. 472
malaccensis, Spreng. 472
qnadrangularis, Ham. 486
ruscifolia, Willd. . 486, 502
saligna, Gmel . . 465
smilacifolia, Wall. . 468
Soneratii, Spreng. . 485
spicata, Ham. . . 502
tomentosa, Ait. . . 469
trinervia, Sm. . . 468
zeylanica, Linn. . . 485

Narthex Asafœtida, Falc. 707
Nelitris pallescens, Miq. 470
paniculata, Lindl. . 470
polygama, Spreng. . 470
polymorpha, Bl. . . 470
Nematopyxis fruticulosa, Miq. . . 588
prostrata, Miq. . . 588
pusilla, Miq. . . 588
Neptunia, *Lour.* . . 285
oleracea, *Lour.* . . 285
plena, *Benth.* . . 286
triquetra, *Benth.* . 286
Nesæa triflora, Kunth. 565
Neurada, *Linn.* . . 368
procumbens, *Linn.* . 368
NEURADEÆ 308
Neurocarpum cajanæfolium, Presl. . 209
retusum, Hassk. . 209
Neustanthus javanicus, Benth. 199

Page
peduncularis, Benth. 197
phaseoloides, Benth. 199
sericans, *Miq.* . . 199
subspicatus, Benth. . 199
Nicolsonia, DC. . . 170
congesta, Wight . . 152
reptans, Meissn. . 173
Nimmonia floribunda Wight 567
Nomismia aurea, W. & A. . . . 221
capitata, W. & A. . 221
nummularia, W. & A. . . . 221
Nothopanax fruticosum, Miq. . . . 725
? *pinnatum*, Miq. . 734
tricochleatum, Miq. 727
Nothopegia, *Blume* . 39
aureo-fulva, *Bedd.* . 40
Colebrookiana, *Bl.* . 40
travancorica, *Bedd.* 40
Notonia Wightii, W. & A. 183
Nysa, *Linn.* 747
sessiliflora, *H.f.* . 747

Octhocaris, *Blume* . . 528
javanica, *Blume* . . 528
paniculata, *Korth.* . 528
Odina, *Roxb.* . . . 29
trinervia, Spreng. . 212
Wodier, *Roxb.* . . 29
Œnanthe, *Linn.* . . 695
benghalensis, *Benth.* 696
corticata, *Edgw.* . 696
Hookeri, *C. B. C.* . 697
javanica, DC. . . 696
laciniatum, Miq. . 696
linearis, *Wall.* . . 696
stolonifera, *Wall.* . 696
Thomsoni, *C. B. C.* 697
Œnothera 582
Oldenlandia digyna, Retz 399
Omphalobium indicum, Gaertn. . . . 51
pinnatum, DC. . . 50
ONAGRACEÆ 582
Onobrychis, *Gaertn.* . 141
cuneifolia, DC. . . 92
diffusa, Camb. . . 140
heterophylla, C. A. M. 142
rotundifolium, Desv. 92
Stewartii, *Baker* . 141
Ononis, *Linn.* . . . 85
altissima, Lam. . . 85
arvensis, Linn. . . 85

Page
Aucheri, Jb. & Sp. . 91
glutinosa, Mart. . . 81
hircina, *Jacq.* . . 85
procurrens, Benth. . 85
Opuntia *Dillenii*, Haw. 657
Oreocome Candolleana, Edgw. 700
elata, Edgw. . . . 700
filicifolia, Edgw. . 700
Ormocarpum, *Beauv.* . 152
coronilloides, G. Don 152
sennoides, *DC.* . . 152
Ormosia, *Jacks.* . . 252
acuminata, Wall. . 250
coarctata, Jacks. . 253
floribunda, Wall. . 252
glauca, *Wall.* . . 253
macrodisca, *Baker* . 253
microsperma, *Baker* 253
parvifolia, *Baker* . 253
robusta, *Wight* . . 252
travancorica, *Bedd.* 253
venosa, *Baker* . . 254
Onithopus perpusillus, Schmidt 161
Orobus aureus, Stev. . 181
Emodi, Wall. . . 181
lævigatus, W. & K. 180
luteus, Linn. . . . 180
orientalis, Boiss. . 181
ORTHOSPERMEÆ . . 605
Orygia, *Forsk.* . . . 661
decumbens, *Forsk.* . 661
Osbeckia. *Linn.* . . 513
alveolata, Bedd. . . 520
angustifolia, Don . 515
aspera, *Blume* . . 519
aspera, Bot. Mag. . 519
aspericaulis, *H. f.* . 520
brachystemon, Ndn. . 514
buxifolia, *Arn.* . . 518
buxifolia, Thwaites . 519
campestris, Wall. . 518
capitata, *Benth.* . . 516
chinensis, *Linn.* . . 515
chinensis, Linn. . . 516
Chulesis, Don . . 522
confertiflora, Naud. 514
crinita, *Benth.* . . 517
crinita, Naud. . . 517
cupularis, *Don* . . 514
debilis, Naud . . 516
decora, Wall. . . 515
Gardneriana, Wight 520
glabrata, Wall. . . 515
glauca, *Benth.* . . 519
glauca, Naud. . . 516

Page
gracilis, *Bedd.* . . 518
hispidissima, *Wight* 516
japonica, Naud . . 515
Kleinii, Arn. . . . 519
Leschenaultiana, *DC.* 520
Leschenaultiana, Dalz. & Gibs. . 514
Leschenaultiana, Thwaites . 514, 515
Leschenaultiana, W. 514
linearis, Blume . . 515
longicollis, Wall. . 518
minor, Thwaites . 519
minor, Triana . . 519
Moonii, *Thwaites* . 520
muralis, Naud . . 514
myrtifolia, Blume . 515
nepalensis, *Hook.* . 521
nutans, *Wall.* . . 521
octandra, *DC.* . . 521
parvifolia, *Arn.* . . 515
polycephala, Naud. . 521
pulchella, Wall. . . 518
reticulata, *Bedd.* . 520
Rheedii, *Thwaites* . 515
rostrata, *Don* . . 517
rubicunda, *Arn.* . 520
serialis, Naud. . . 516
speciosa, Don . . 522
stellata, DC. . . . 517
stellata, Don . . . 517
stellata, Naud. . . 517
stellata, *Wall.* . . 517
ternifolia, Don . . 517
tetrandra, Roxb. . 545
truncata, *Don* . . 514
truncata, Arn. . . 514
virgata, W. & A. . 521
virgata, Wight . . 521
Walkeri, *Arn.* . . 519
Wightiana, *Benth.* . 519
Wightiana, Bth. 514, 521
Wynaadensis, *C. B. Clarke* . . 521
zeylanica, *Willd.* . 516
zeylanica, Bot Reg. 515
zeylanica, Naud. . 515
zeylanica, Steud. . 514
OSBECKIEÆ 512
Osbeckioidea, Griff. . 516
Osmelia, *Thwaites.* . 595
zeylanica, *Thwaites* 595
Osmorrhiza, *DC.* . . 690
brevistylis, DC. . . 690
Claytoni, *C. B. C.* . 690
laxa, Royle . . . 690
longistylis, DC. . . 690

Page
Otanthera, *Blume* . . 522
bracteata, Korth . 522
cyanoides, Triana . 522
Koti-gueda, Naud. . 523
moluccana, *Blume* . 522
nicobarensis, *Teysm. & Binn.* . . . 522
rubro-limbata, Link. & Otto 523
Otosema caudata, Bth. 109
extensa, Benth. . . 109
fruticosa, Benth. . 109
macrophylla, Benth. 101
Ougeinia, *Benth.* . . 160
dalbergioides, *Benth.* 161
Outea bijuga, DC. . . 275
Oxydium, Bennett. . 174
Oxyramphis macrostyla, Lindl. . . 144
macrostyla, Wall. . 144
sericea, Grah. . . 144
stenocarpa, Klotz. . 144
virgata, Wall. . . 144
Oxyspora, *DC.* . . . 525
cernua, *Triana* . . 526
paniculata, *DC.* . . 525
vagans, *Wall.* . . 526
vagans, Bot. Mag. . 525
vagans, Wall. . . 526
OXYSPOREÆ 512
Oxytropis, *DC.* . . 137
cachemirica, *Camb.* 139
chyliophylla, Royle . 139
densa, *Benth.* . . 133
diffusa, *Led.* . . . 140
floribunda, Benth. . 138
glabra, DC. . . . 140
glacialis, Benth. . . 147
humifusa, *Kar. & Kir.* 137
lapponica, *Gaud.* . 137
Meinshausenii, *Schr.* 139
microphylla, *DC.* . 139
microrhyncha, Bth. . 137
mollis, *Royle* . . 137
Stracheyana, *Benth.* 138
tatarica, *Jacquem.* . 138
Thomsoni, *Benth.* . 138
Ozodia fœniculacea, W. & A. . . . 695

Pachycentria tuberculosa, Korth. . . 565
Walkeri, Thwaites . 526
Pachyrhizus, Rich. . 207
angulatus, Rich. . 207
mollis, Hassk. . . 199

Page
trilobus, DC. . . . 207
Padbruggia dasyphylla, Miq. 110
Palimbia ramosissima, DC. 709
ramosissima, Thw. . 710
PANACEÆ 720
Panax, *Linn.* . . . 725
aculeatum, Ait. . . 726
armatum, Wall. . . 723
bijugum, Wall. . . 725
bipinnatifidum, Seem. 722
curcifolia, Griff. . 735
decompositum, Wall. 722
? *foliolosum*, Wall. . 723
fragrans, Roxb. . 734
fruticosum, *Linn.* . 795
Ginseng, C. A. Meyr. 721
? *Heyneanum*, Wall. 727
Jackianum, Wall. . 734
Leschenaultii, DC. . 724
Loureirianum, DC. . 726
palmatum, Roxb. . 735
pinnatum, Lamk. . 734
polycarpum, Wall. . 734
Pseudo-ginseng, Wall. 721
secunda, Schultz . 734
serratum, Wall. . . 738
tomentosum, DC. . 728
tripinnatum, Wall. . 722
PAPILIONACEÆ . . . 56
Papularia crystallina, Forsk. 660
Paraderris, Benth. . 242
Parastemon, *A. DC.* . 312
urophyllum, *A. DC.* 312
Paratropia capitata, W. & A. . . . 732
elliptica, Miq. . . 729
heterophylla, Presl. 731
macrantha, Miq. . 729
subulata, Miq. . . 730
terebinthacea, Ain. . 730
venulosa, W. & A. . 729
Wallichiana, Dalz. & Gibs. 730
Parinarium, *Juss.* . . 308
asperulum, *Miq.* . 310
corymbosum . . . 310
costatum, *Blume?* . 309
dillenifolium, B. Br. 312
excelsum, G. Don. . 312
Griffithianum, *Bth.* 310
Helferi, H. f. . . . 311
indicum, *Bedd.* . . 311
? *Jackianum*, Benth. 312

Page
multiflorum, Miq. . 310
nitidum, *H. f.* . . 310
oblongifolium, *H. f.* 309
polyneurum, *Miq.* . 309
salicifolium, Benth. 310
sumatrana, Jack. . 309
? *sumatranum*, Kurz. 311
sumatranum, Benth. 309
travancoricum, *Bedd.* 311
Wallichianum, Wall. 311
Parishia, *H. f.* . . . 29
insignis, *H. f.* . . 30
Maingayi, *H. f.* . . 30
pubescens, *H. f.* . 30
Parkia, *R. Br.* . . . 289
biglandulosa, *W. & A.* . . . 289
biglobosa, Benth. . 289
Brunonis, Grah. . 289
insignis, *Kurz.* . . 290
leiophylla, *Kurz.* . 289
Roxburghii, *G. Don.* 289
Parkinsonia, *Linn.* . 260
aculeata, *Linn.* . . 260
Parnassia, *Linn.* . . 401
affinis, H. f. & T. . 403
cabulica, Planch. . 403
foliosa, *H. f. & T.* . 402
foliosa, Drude . . 402
Laxmanni, Pall. . 403
maisorensis, Hend. . 403
mysorensis, *Heyne* . 402
nubicola, *Wall.* . . 402
Nummularia, Drude 402
ornata, Wall. . . 402
ovata, *Ledeb.* . . 403
palustris, *Linn.* . 401
pusilla, *Wall.* . . 403
Schmidii, Zenker. . 402
subacaulis, K. & K. 403
tenella, *H. f. & T.* . 403
trinervis, Drude . . 403
Turczaninovii, Led. 403
Wightiana, *Wall.* . 402
Parochetus, *Hamilt.* . 86
communis, *Hamilt.* . 86
maculata, R. Br. . 87
major, Don. . . . 86
oxalidifolia, Royle . 87
Paropsia, *Noronh.* . . 600
malayana, *Planch.* . 600
vareciformis, *Mast.* 600
Parrottia, *C. A. Meyer* 426
Jacquemontiana, *Dcne.* 429
Passiflora, *Linn.* . . 599
caloneura, Kurz. . 600
geminiflora, Don. . 600

Page
Heyneana, Wall. . 600
Leschenaultii, *DC.* 599
nepalensis, *Wall.* . 600
penangiana, Wall. . 603
singaporeana, Wall. 606
Walkeriæ, Wight . 599
PASSIFLOREÆ . . . 598
Pastinaca, Candolleana, W. & A. . . . 715
glauca, Dalz. . . 709
grandis, Dalz. & Gibs. 710
Hookeriana, Wight. 715
ligusticifolia, Wight. 715
rigens, Wight. . . 715
Sprengeliana, Wight 715
Pegia Colebrookiana, Wt. 40
nitida, Coleb. . . 28
Pellacalyx, *Korth.* . 440
axillaris, *Korth.* . 440
Peltophorum, *Vogel.* . 257
dasyrachis, *Kurz* . 257
ferrugineum, *Benth.* 257
Pemphis, *Forst.* . . 572
acidula, *Forst.* . . 573
angustifolia, Roxb. 573
Pentapanax, *Seem.* . 728
Leschenaultii, *Seem.* 724
Leschenaultii, Seem. 725
micranthum, Wall. . 724
parasiticum, *Seem.* . 724
racemosum, *Seem.* . 724
subcordatum, *Seem.* 724
umbellatum, *Seem.* . 725
Pentaptera augustifolia, Roxb. . . 447
Arjuna, Roxb. . . 447
bialata, Roxb. . . 449
coriacea, Roxb. . . 448
crenulata, Roxb. . 448
glabra, Roxb. . . 447
macrocarpa, Wall. . 448
paniculata, Roxb. . 448
pyrifolia, Presl. . 448
pyrifolia, Wall. . . 453
Roxburghii, Tul. . 452
Saja, Wall. . . . 448
tomentosa, Roxb. . 447
undulata, Wall. . 455
Pentaspadon, *H.f.* . 28
velutinus, *H. f.* . . 28
Peplis indica, Willd. . 566
Pericopsis, *Thwaites* . 252
Mooniana, *Thwaites* 252
Persica vulgaris, Mill. 313
Pestalozzia laxa, Thw. 633
pedata, Zoll. & Mor. 633
Page
Petaloma alternifolia, Roxb. 452
Petrocarya dillenifolia, Steud. 312
excelsa, Jack. . . 312
Petrosciadium cæspitosum, Edgw. . . 689
PEUCEDANEÆ . . 660, 670
Peucedanum, *Linn.* . 708
anamallayense, *C. B. Clarke* . . 710
ceylanicum, *Gardn.* 710
Dhana, *Ham.* . . . 709
dissectum, DC. . . 701
glaucum, *DC.* . . 710
glaucum, H.f. & T. 712
grande, *C. B. C.* . 710
graveolens, *Benth.* . 709
ramossisimum, *Wall.* 709
sikkimense, *C. B. C.* 710
? *skardicum*, C. B. C. 711
Sowa, Kurz. . . . 709
Thomsoni, *C. B. C.* 711
Wallichianum, DC. 700
Phaca astragalina, DC. 124
cachemerica, Benth. 126
frigida, Linn. . . 130
Hoffmeisteri, Kl. . 121
lapponica, DC. . . 137
longicaulis, Benth. . 126
Vogelii, Webb . . 121
Phanera Blancoi, Bth. 278
bidentata, Benth. . 279
bracteata, Benth. . 282
diphylla, Benth. . 278
diptera, Miq. . . 285
elongata, Benth. . 281
excelsa, Blume . . 283
glabrifolia, Benth. . 281
glauca, Benth. . . 283
Griffithiana, Benth. 283
ferruginea, Benth. . 283
Finlaysoniana, Bth. 278
integrifolia, Benth. . 279
lucida, Benth. . . 278
macrostachya, Bth. 282
nervosa, Benth. . . 283
phœnicea, Benth. . 283
purpurea, Benth. . 284
retusa, Benth. . . 279
rufa, Benth. . . . 280
semibifida, Benth. . 280
Vahlii, Benth. . . 279
variegata, Benth. . 284
velutina, Benth. . . 280
Pharnaceum Cerviana, Linn. 663
distichum, Linn. . 663
Page
Mollugo, Linn. . . 662
occultum, Forsk. . 664
parviflorum, Roth. . 662
pentagonum, Roxb. 662
pentaphyllum, Spr. 663
spathulatum, Spr. . 664
strictum, Spreng. . 663
triphyllum, Spreng. 663
PHASEOLEÆ 58
Phaseolus, *Linn.* . . 200
aconitifolius, *Jacq.* . 202
adenanthus, *G. F. Meyer* 200
alatus, Roxb. . . 200
amarus, Roxb. . . 200
angustifolius, Wall. 206
aureus, Ham. . . 203
calcaratus, *Roxb.* . 203
circinalis, Ham. . 219
cirrhosus, H.B.K. . 200
coccineus, Lam. . . 200
compressus, DC. . 200
cornutus, Blume . 202
decurrens, Grah. . 199
difformis, Wall. . 207
dolichoides, Roxb. . 206
farinosus, Linn. . 203
fuscus, *Wall.* . . 204
fusiformis, Grah. . 206
glaber, *Roxb.* . . 203
glabrescens, Steud. . 203
gonospermus, DC. . 200
Grahamianus, *W. & A.* . . . 201
grandis, *Dalz. & Gibs.* 202
grandis, Wall. . . 204
hæmatocarpus, DC. 200
hirtus, Retz. . . . 203
hirtus, Wall. . . 203
inamœnus, Linn. . 200
lucens, Wall. . . . 207
lunatus, *Linn.* . . 200
Max, Roxb. . . . 203
multiflorus, Willd. . 200
Mungo, *Linn.* . . 203
Mungo, Wall. . . 203
nanus, Linn. . . . 200
oblongus, DC. . . 200
obovatus, Grah. . . 205
pauciflorus, *Dalz. & Gibs.* 202
psoraleoides, *W. & A.* . . . 201
puberulus, H. B. K. 200
pubescens, Blume . 203
pulniensis, Wight. . 206
radiatus, *Linn.* . . 203

Page
repens, Grah. . . 205
Roxburghii, W. & A. 203
rostratus, Wall. . . 200
saponaceus, DC. . 200
semierectus, *Linn*. . 201
senegalensis, Guill. . 200
sepiarius, Dalz. . . 206
setulosus, Dalz. . . 203
sphæricus, DC. . . 200
sublobatus, Grah. . 201
sublobatus, Wall. 202, 203
subvolubilis, Ham. . 203
tenuicaulis, *Baker* . 201
torosus, Roxb. . . 204
trilobus, *Ait*. . . 201
trilobus, Wall. . . 202
trinervius, *Heyne* . 203
truxillensis, H. B. K. 200
tumidus, DC. . . 200
tunkinenses, Lour. . 200
velutinus, *Grah*. . 204
vexillatus, Linn. . 206
vulgaris, *Linn*. . 200
vulgaris, Wall. . . 200
Wightianus, *Grah*. 203
Wightii, W. & A. 203
Xuaresii, Zucc. . . 200
Phellandrium, Wall. . 682
stoloniferum, Roxb. 696
Philadelphus, *Linn*. . 407
coronarius, *Linn*. . 407
corymbosus, Wall. . 406
nepalensis, Loud. . 407
tomentosus, Wall. . 407
triflorus, Wall. . . 407
Phlebochiton extensum, Wall. 28
Photinia, *Lindl*. . . 380
? arguta, Wall. . . 382
Blumei, Dcne. . . 380
? dubcia, Lindl. . . 371
dubia, Wall. . . 371
dubia, Wenzig. . . 371
eugenifolia, Lindl. . 381
Griffithii, *Dcne*. . 381
integrifolia, *Lindl*. . 381
Lindleyana, *W. & A*. 380
longifolia, Dcne. . 370
micrantha, Dcne. . 381
mollis, *H. f*. . . 381
Notoniana, Wall. . 380
Notoniana, *W. & A*. 380
polyneura, King . 377
serrulata, Lindl. . 380
subsessilis, King. . 371
Phyllagathis, *Blume* . 541

Page
rotundifolia, *Blume* 541
Phyllodium pulchellum, Desv. 162
vestitum, Benth. . 162
Pileostegia, *H. f. & T*. 405
viburnoides, *H. f. & T*. . . 405
Pileostigma malabarica, Benth. . 277
racemosa, Benth. . 276
Pimenta acris, Wight 462
Pimpinella, *Linn*. . 684
achilleifolia, *C. B. C*. 684
acronemæfolia, *C. B. Clarke* . . 686
acuminata, *C. B. C*. 686
adscendens, *Dalz*. . 689
anethifolia, Don. . 683
bella, *C. B. Clarke* 686
cæspitosa, *Benth*. . 689
Candolleana, *W. & A*. 687
crinitum, Boiss. . 719
diversifolia, *DC*. . 688
hastata, *C. B. C*. . 687
Heyneana, *Wall*. . 684
Hookeri, *C. B. C*. . 687
involucrata, Miq. . 697
? involucrata, W. & A. . . . 682
javana, DC. . . . 687
lateriflora, *Dalz. & Gibs*. . 689
Leschenaultii, *DC*. 687
monoica, *Dalz*. . . 687
nervosa, *C. B. Clarke* 684
Parishiana, *Kurz* . 688
pubescens, Wall. . 688
rhodantha, Boiss. . 685
Saxifraga, *Linn*. . 685
sikkimensis, *C. B. C*. 685
sikkimensis, Benth. 699
sinica, Hance . . 688
Stracheyi, *C. B. C*. . 688
tenera, *Benth*. . . 686
tomentosa, *Dalz*. . 689
trifoliata, Wall. . 688
Wallichii, *C. B. C*. . 685
Piptadenia, *Benth*. . 289
oudhensis, *Brand*. . 289
Piptanthus, *D. Don* . 62
nepalensis, *D. Don* 62
Pirigarda valida, Bl. . 511
Pistacia, *Linn*. . . 13
integerrima, *Stew*. . 13
Pisum arvense, Linn. 181
sativum, Linn. . 181
Pithecolobium, *Mart*. 302

Page
affine, *Baker* . . 304
anamallayanum, Bedd. 305
angulatum, *Benth*. . 306
bigeminum, *Benth*. 303
bubalinum, *Benth*. 304
Clypearia, *Benth*. . 305
confertum, *Benth*. . 304
contortum, *Mart*. . 305
dulce, *Benth*. . . 302
falcifolium, Hassk. 306
fasciculatum, *Benth*. 304
geminatum, Benth. 303
lobatum, *Benth*. . 305
microcarpum, *Benth*. 304
montanum, *Benth*. . 306
nitidum, Benth. . 303
subcoriaceum, *Thw*. 305
umbellatum, *Benth*. 303
Pituranthos, *Viv*. . . 679
nuda, *Benth*. . . 680
Thomsoni, *C. B. C*. 680
Planchonia, *Blume* . 511
littoralis, *Van Houtte* 511
littoralis, Miers . . 511
Plectronia chinensis, Lour. 726
PLERANDEÆ 721
Pleurospermum, *Hoffm*. 702
angelicoides, *Benth*. 703
apiolens, *C. B. Clarke* 705
Benthami, *C. B. C*. 703
Brunonis, *Benth*. . 706
Candollii, *Benth*. . 703
cicutarium, Lindl. . 700
densiflorum, *Benth*. 705
dentatum, *Benth*. . 704
Govanianum, *Bth*. . 702
Hookeri, *C. B. C*. . 705
pumilum, *Benth*. . 704
? rotundatum, *Benth*. 703
sikkimense, *C. B. C*. 702
stellatum, *Benth*. . 704
stylosum, *C. B. C*. . 704
Plinia pedunculata, Linn. f. . . . 505
rubra, Linn. . . 505
Podalyria bracteata, Roxb. 248
PODALYRIEÆ . . . 56
Podocarpium, Benth. . 165
Podolotus hosackioides, Royle 123
Pogonanthera, *Blume*. 550
pulverulenta, *Blume* 550
Poinciana, *Linn*. . . 260
elata, *Linn*. . . . 260
pulcherrima, Linn. . 255

Page
regia, *Bojer* 260
Roxburghii, G. Don 257
Poivrea Roxburghii, DC. 452
Polydontia arborea, Bl. 320
Polyodontia ?ceylanica, Wight 319
Walkerii, Blume . 321
Polyosma, *Blume* . . 408
fragrans, *Benn.* . . 408
ilicifolia, Blume . 409
integrifolia, *Blume* 409
lætevirens, Griff. . 409
mutabilis, *Blume* . 409
Wallichii, *Kurz.* . 409
Polyscias, *Forst.* . . 727
acuminata, *Seem.* . 727
pinnata, *Forst.* . . 727
Polystorthia, Blume . 320
Polyzygus, *Dalz.* . . 697
tuberosus, *Dalz.* . 698
Pomarc, Griffith . 381
Pomasterion japonicum, Miq. . . . 633
Pongamia, *Vent.* . . 239
acuminata, Grah. . 247
amœna, Wall. . . 245
angustifolia, Ham. 110
atropurpurea, Wall. 108
cærulea, Grah. . . 107
cana, Grah. . . . 105
canarensis, Dalz. . 246
cassioides, Wall. . 105
caudata, Grah. . . 109
cinerea, Grah. . . 106
Corcor, Grah. . . 105
coriacea, Grah. . . 240
crassifolia, Wall. . 194
cuneifolia, Grah. . 243
dubia, Grah. . . 243
elegans, Grah. . . 242
elliptica, Wall. . . 243
elongata, Grah. 243, 247
emarginata, Wall. . 245
extensa, Wall. . . 109
ferruginea, Wall. . 246
floribunda, Grah. . 242
fruticosa, Grah. . 109
glabra, *Vent.* . . 240
grandifolia, Grah. . 246
heterocarpa, Wall. . 106
Heyneana, Grah. . 244
Heyneana, W. & A. 245
Horsfieldii, Miq. . 243
hypoleuca, Miq. . . 243
macrophylla, Grah. 108
marginata, Grah. . 243
monadelpha, Grah. 243
oblonga. Grah. . . 106
oblonga, Wall. . . 246
obovata, Wall. . . 243
ovalifolia, W. & A. 247
palustris, Grah. . 106
paniculata, Grah. . 106
paniculata, Wight . 245
pendula, Grah. . . 105
racemosa, Grah. . 105
reflexa, Grah. . . 245
religiosa, Wt. . . 241
rigida, Wall. . . 194
rosea, Grah. . . 194
secunda, Grah. . . 247
sericea, Vent. . . 104
sinuata, Wall. . . 246
tetraptera, Ht. Calc. 106
triphylla, Wt. . . 241
uliginosa, DC. . . 241
volubilis, Zoll. & Moritz. . . . 243
Pootia cereopsifolia, Miq. 439
Portulaca decumbens, Vahl. 661
Potentilla, *Linn.* . . 345
adnata, Wall. . . 343
albifolia, *Wall.* . 347
alpestris, H. f. & T. 357
altaica, *Bung.* . . 354
ambigua, *Camb.* . 348
amurensis, Maxim. 359
anserina, *Linn.* . . 350
Arbuscula, Don . 347
argentea, *Linn.* . 356
argyrophylla, H. f. & T. 358
argyrophylla, *Wall.* 356
Atropos, Hoffm. . 360
atrosanguinea, Lodd. 357
axilliflora, *H. f.* . 346
bannehalensis, Camb. 350
barbata, Wall. . . 349
bidens, Bertol. . . 353
bifurca, *Linn.* . . 358
bifurcata, Wall. . 355
breviscissa, Bertol. . 354
cæspitosa, Lehm. . 358
cana, Wall. . . . 359
Candolleana, Royle 357
cataclines, Lehm. . 357
Cautleyana, Royle . 357
cicutariæfolia, Willd. 359
cinerascens, Bertol. 354
Clarkei, *H. f.* . . 351
coccinea, Hoffm. . 355
colorata, Lehm. . 355
commutata, Lehm. . 353
coriandrifolia, *Don* . 353
cryptantha, Kl. . 358
cuneata, Wall. . . 348
cuneifolia, Bertol. . 348
curviseta, *H. f.* . . 358
denticulata, Ser. . 359
denticulosa, Ser. . 343
depressa, Wall. . . 352
desertorum, *Bunge* . 355
discolor, Camb. . . 348
doubjouneana, *Camb.* 357
Durandii, T. & Gr. . 343
eriocarpa, *Wall.* . 348
formosa, Don . . 355
fragariæfolia, Klotz. 343
fragarioides, *Linn.* 350
fragiformis, Willd. 357
fruticosa, *Linn.* . 347
fulgens, *Wall.* . . 349
gelida, *C. A. Meyer.* 357
Gerardiana, Wall. 350
glauca, Camb. . . 353
gracilis, Wall. . . 359
Grahamiana, Wight 350
grandiflora, Hf. & T. 357
Griffithii, *H. f.* . . 351
Gul. Waldmeri, Kl. 355
Heynii, Roth. . . 359
hololeuca, *Boiss.* . 354
Inglisii, Royle . . 348
insignis, Royle . . 357
Jacquemontiana, Cambess. . . . 357
kashmirica, *H. f.* . 355
Kleiniana, *W & A.* . 359
Leschenaultiana, *Ser.* 350
leucochroa, Lindl. . 357
leuconota, *Don* . . 352
leuconota, Wall. . . 351
Lindenbergii, Lehm. 348
lineata, Trevir. . . 349
meifolia, Wall. . . 353
microphylla, *Don* . 352
monanthes, *Lindl.* . 358
Mooniana, *Wight* . 349
Moorcroftii, Wall. . 353
multifida, *Linn.* . . 358
Munroana, Lehm. . 350
Naspata, Ham. . . 349
nepalensis, *Hook.* . 355
nivea, *Linn.* . . . 358
obovata, Bertol. . 359
ochreata, Lindl. . . 357
peduncularis, *Don* . 351
perpusilla, *H. f.* . . 346
polyphylla, Wall. . 349

Page
polychista, Boiss. . 354
procumbens, Clairv. 345
pseudo-anserina, Bert. 350
pteropoda, *Royle* . 356
pteropoda, Hoffm. . 360
purpurea, *Royle*. . 347
reptans, *Linn.* . . 356
reticulata, Bertol. . 347
rigida, Wall. . . . 347
ruthenia? Hb. Ham. 359
Salessovii, *Steph.* . 348
Saundersiana, Royle 354
sericea, *Linn.* . . 354
Sibbaldi, *Haller, f.* . 345
Sibbaldia, Griess . 346
Sieversiana, Lehm. 349
soongarica, Bunge . 354
sordida, Klotzsch. . 349
splendens, Wall. . . 349
supina, *Linn.* . . 359
tenella, Turcz . . 354
tetrandra, *Bunge* . 346
trifida, Lehm. . . 343
trullifolia, *H. f.* . . 345
variabilis, Klotzsch. 350
velutina, Wall. . . 351
verticillaris, *Steph.* 354
vestita, Kl. . . . 357
Wallichiana, Govan 357
Wallichiana, Ser. . 343
Wallichiana, Wall. . 359
POTENTILLEÆ . . . 307
POTERIEÆ 308
Poterium, *Linn.* . . 362
diandrum, *Wall.* . 392
filiforme, *H. f.* . . 362
indicum, *Gardn.* . 362
longifolia, *Bertol.* . 363
Sanguisorba, *Linn.* 363
Poupartia mangifera, Blume 43
pinnata, Blanco . . 43
Pourthiæa, *Dcne.* . . 382
arguta, *Dcne.* . . 382
Hookeri, Dcne. . . 382
salicifolia, Dcne. . 382
Prangos, *Lindl.* . . 695
pabularia, *Lindl.* . 695
Prinsepia, *Royle* . . 322
utilis, *Royle* . . . 323
Priotropis, *W. & A.* . 65
cytisoides, *W. & A.* 65
Prosopis, *Linn.* . . 287
spicigera, *Linn.* . . 288
spicata, Burm. . . 288
Stephaniana, *Kunth.* 288
PRUNEÆ 307

Page
Prunus, *Linn.* . . . 312
acuminata, *Wall.* . 317
adenophylla, Wall. . 316
aloochao, Royle . . 315
amygdalus, Baill. . 313
armeniaca, Linn. . 313
Avium, Linn. . . 313
bokhariensis, Royle . 315
caproniana, DC. . . 313
cerasoides, Don . . 314
Cerasus, Linn. . . 313
communis, *Huds.* . 315
ferruginea, Wall. . 314
humilis, Bunge . . 314
institia, Linn. . . 315
Jacquemontii, *H. f.* 314
javanica, Miq. . . 316
Jenkinsii, *H. f. & T.* 317
Junghuhniana, Miq. 317
Mahaleb, L. . . . 312
martabanica, *Wall.* 316
nepalensis, *Ser.* . . 316
Padus, *Linn.* . . . 315
persica, Benth. & H. f. 313
prostrata, *Labill.* . 313
Puddum, *Roxb.* . . 314
punctata, *H. f. & T.* 317
rufa, *Wall.* . . . 314
? *saligna*, Royle . . 313
sylvatica, Roxb. . 314
tomentosa, *Thunb.* . 314
trichocarpa, Bunge . 314
triflora, *Roxb.* . . 315
undulata, *Ham.* . 316
Psammanthe marina, Hance 659
Psammogeton, *Edgw.* . 719
biternatum, *Edgw.* . 719
crinitum, Boiss. . . 719
Pseudarthria, *W. & A.* 153
capitata, Hassk. . 171
gyrans, Hassk. . . 174
polycarpa, Hassk. . 170
viscida, *W. & A.* . 154
Psidium, *Linn.* . . . 467
Guyava, *Linn.* . . 468
pyriferum, Linn. . 468
pomiferum, Linn. . 468
Psophocarpus, *Neck.* . 211
longepedunculatus, Hassk. 212
palmettorum, Guill. & Per. 212
palustris, *Desv.* . . 212
tetragonolobus, *DC.* 211
Psoralea, *Linn.* . . 103
corylifolia, *Linn.* . 103

Page
plicata, *Delile* . . 103
tetragonoloba, Linn. 92
Pternandra, *Jack* . . 551
cærulescens, *Jack* . 551
capitellata, *Jack* . 551
echinata, Jack . . 552
echinata, Wall. . . 552
latifolia, Triana . 551
paniculata, *Benth.* . 561
Pterocarpus, *Linn.* . 238
bilobus, Roxb. . . 239
dalbergioides, Roxb. 238
indicus, *Willd.* . . 238
macrocarpus, *Kurz* 239
Marsupium, *Roxb.* . 239
santalinus, *Linn. f.* 239
Wallichii, W. & A. 238
Pterocyclus angelicoides, Kl. . . . 703
Pterolobium, *R. Br.* . 259
indicum, *A. Rich.* . 259
lacerans, Wall. 256, 259
macropterum, *Kurz* 259
microphyllum, *Miq.* 259
Pteroloma triquetrum, Benth. 163
Ptychotis? Wall. . . 682
achilleifolia, DC. . 684
Ajowan, DC. . . . 682
anethifolia, DC. . . 683
coptica, DC. . . . 682
Roxburghiana, DC. . 682
Pueraria, *DC.* . . . 157
brachycarpus, *Kurz* 169
Candollei, *Grah.* . 197
composita, Grah. . 198
hirsuta, *Kurz* . . 199
javanica, Benth. . 199
javanicus, *Benth.* . 199
peduncularis, *Grah.* 197
phaseoloides, *Benth.* 199
Stracheyi, *Baker* . 198
stricta, *Kurz* . . 198
subspicata, Benth. . 199
Thomsoni, *Benth.* . 198
tuberosa, *DC.* . . 197
Wallichii, *DC.* . . 198
Punica, *Linn.* . . . 580
Granatum, *Linn.* . 581
nana, Linn. . . . 581
Pycnocycla, *Lindl.* . 694
abyssinica, Hochst. 694
glauca, *Lindl.* . . 694
Pycnospora, *R. Br.* . 153
hedysaroides, *R. Br.* 153
nervosa, W. & A. . 153
Pygeum, *Gaertn.* . . 318
acuminatum, *Coleb.* 318

Page

acuminatum, H. f. & T. 319
? *acuminatum*, Wt. . 321
Andersoni, *H. f.* . 320
arboreum, *Endl.* . 322
arboreum, Endl. . 320
brevifolium, *H. f.* . 321
capitellatum, *H. f.* . 321
ceylanicum, Bedd. . 319
ceylanicum, *Gaertn.* 321
Gardneri, *H. f.* . . 321
glaberrimum, *H. f.* . 319
Griffithii, *H. f.* . . 322
Lampongo, *Kurz* . 320
lanceolatum, *H. f.* 319
latifolium, Miq. . 322
Maingayi, *H. f.* . 319
montanum, *H. f.* . 321
parviflorum, *Teysm. & Binnend.* . . 320
persimile, *Kurz* . . 320
polystachyum, *H. f.* 320
Walkerii, Blume . 321
Wightianum, *Blume* 319
zeylanicum, Dalz. & Gibs. 321
Pyracantha crenulata, Roem. 384
Pyrranthus albus, Wall. 452
littoreus, Jack . . 452
Pyrrotrichia tuberosa, W. & A. 219
Pyrus, *Linn.* . . . 372
Aria, L. ? 375
Aucuparia, *Gaertn.* . 375
baccata, *Linn.* . . 373
castaneifolia, Dcne. 379
communis, *Linn.* . 374
crenata, Don . . . 380
crenata, Lindl. . . 375
cuspidata, *Bertol.* . 378
Cydonia, Linn. . . 369
ferruginea, *H. f.* . 379
foliolosa, *Wall.* . . 376
foliolosa, Wall. . . 377
granulosa, *Bertol.* . 378
Griffithii, *Dcne.* . 377
indica, Wall. . . 369
insignis, *H. f.* . . 377
integerrima, Don . 381
Jacquemontiana, *Dcne.* 374
Karensium, Kurz . 378
khasiana, *Dcne.* . . 378
kumaonensis, Wall. . 375
kumaoni, *Dcne.* . . 374
lanata, *Don* . . . 375

Page

Malus, *Linn.* . . . 373
microphylla, *Wall.* 376
nepalensis, Hb. Ham. 374
Nussia, Ham. . . 383
Pashia, *Ham.* . . 374
polycarpa, *H. f.* . 378
rhamnoides, *Dcne.* . 377
Sieversii, Ledeb. . 379
sikkimensis, *H. f.* . 373
sikkimensis, Wenzig. 377, 378, 379
Thomsoni, *King.* . 379
ursina, Hb. Strach. 376
ursina, Wall. . . 376
variolosa, Wall. . 374
verruculosa, Bertol. 374
vestita, *Wall.* . . 375
Wallichii, *H. f.* . . 376
Quisqualis, *Linn.* . . 459
confertum, Jack . . 460
densiflora, *Wall.* . 460
ebracteata, Beauv. . 459
glabra, Burm. . . 459
indica, *Linn.* . . 459
longiflora, Presl. . 459
Loureiri, G. Don. . 459
malabarica, *Bedd.* . 460
pubescens, Burm. . 459
sinensis, Lindl. . . 459
villosa, Roxb. . . 459
Rampinia herpetospermoides, C. B. Clarke 613
Rectomitra tuberculata, Blume 553
Reichardia decapetala, Roth. 256
hexapetala, Roth. . 259
Reutera acuminata, Edgw. 686
Rhipsalis, *Gaertn.* . . 658
Cassytha, *Gaertn.* . 658
Rhizophora, *Linn.* . . 435
apiculata, Blume . 436
Candel, Linn. . . 437
candelaria, DC. . . 436
candelaria, W. & A. 435
caryophylloides, Jacq. 438
caseolaris, Linn. . . 580
conjugata, *Linn.* . 436
cylindrica, Linn. . 438
cylindrica, Roxb. . 438
decandra, Roxb. . . 436
gymnorrhiza, Roxb. 437
macrorrhiza, Griff. . 435
Mangle, Linn. . . 435
mucronata, *Lam.* . 435

Page

parviflora, Roxb. . 438
timorensis, DC. . . 436
RHIZOPHOREÆ . . . 434
Rhodamnia, *Jack.* . . 468
cinerea, Griff. . . 468
cinerea, Jack. . . 469
concolor, Miq. . . 468
Mulleri, Bl. . . . 469
Nageli, Miq. . . . 469
spectabilis, Blume . 468
subtriflora, Bl. . . 469
trinervia, *Blume* . 468
Rhodiola asiatica, Don. 419
imbricata, Edgw. . 417
rosea, Linn. . . . 417
Rhodomyrtus, *DC.* . 469
tomentosa, *Wight.* . 469
Rhynchocarpa, *Schr.* . 627
? *deltoidea*, Kurz. . 627
fœtida, *Schrad.* . . 627
rostrata, Kurz. . . 627
Rhynchosia crotalarioides, DC. . . 229
lucida, DC. . . . 191
rosea, DC. 196
viscida, DC. . . . 154
Rhus, *Linn.* 9
acuminata, *DC.* . . 12
acuminata, DC. . . 12
Amela, Don . . . 10
buckiamela, Roxb. . 10
Cotinus, *Linn.* . . 9
Dhuna, *Hamilton* . 11
Griffithii, *H. f.* . . 12
insignis, *H. f.* . . 11
integerrima, Wall. . 13
javanica, L. . . . 10
juglandifolia, Wall. 11
Kakrasingee, Royle. 13
khasiana, *H. f.* . . 10
lævis, Wall. . . . 9
mysorensis, *Heyne.* . 9
paniculata, *Wall.* . 10
parviflora, *Roxb.* . 9
punjabensis, *Stewart* 10
semi-alata, *Murray.* 10
succedanea, *Linn.* . 12
velutina, Wall. . . 9
vernicifera, DC. . . 11
Wallichii, *H. f.* . . 11
Rhyncosia, *Lour.* . . 220
acutissima, *Thwaites* 226
aurea, *DC.* . . . 221
avensis, *Benth.* . . 222
Beddomei, *Baker* . 222
biflora, DC. . . . 215
bracteata, *Benth.* . 225
cana, *DC.* 222

Page
Candollei, Dcne. . 224
capitata, DC. . . 221
coodoorensis, Bedd . 220
cyanosperma, *Benth.* 222
densiflora, *DC.* . . 220
densiflora, Wall. . . 221
elongata, DC. . . 221
ervoidea, DC. . . . 223
Falconeri, *Baker* . 224
filicaulis, Grah. . . 224
filipes, *Benth.* . . 221
Grahami, Wall. . . 219
Heynei, *W. & A.* . 220
himalensis, *Benth.* . 225
laxiflora, Camb. . . 223
medicaginea, DC. . 223
Memnonia, *DC.* . . 224
microphylla, Wall. . 224
minima, *DC.* . . . 223
mollissima, Dalz. . 226
nuda, DC. 223
nummularia, *DC.* . 221
pilosa, *Wall.* . . . 224
prostrata, Grah. . . 223
pseudo-cajan, *Camb.* 223
pulverulenta, Stocks 224
rhombifolia, DC. . 223
rufescens, *DC.* . . 220
scarabæoides, DC. . 215
sericea, *Spanoghe* . 225
stipulosa, A. Rich. . 225
suaveolens, *DC.* . . 221
tenuicaulis, Wall. . 224
velutina, Grah. . . 215
velutina, *W. & A.* . 224
vestita, Wall. . . 216
villosula, Thwaites . 225
virgata, Grah. . . 219
viscosa, *DC.* . . . 225
Wightiana, Grah. . 212
Rhytidandra, A. Gray. 742
Ribes, *Linn.* 409
acuminatum, Wall. . 410
alpestre, Dcne. . . 410
desmocarpum, *H. f. & T.* 410
glaciale, *Wall.* . . 410
glutinosum, Jacq. . 410
Griffithii, *Hf. & T.* . 411
Grossularia, *Linn.* . 410
heterotrichum, Ledeb. 410
Himalayense, Dcne. . 411
Himalensis, Royle. . 410
leptostachyum, Dcne. 410
luridum, *H. f. & T.* . 410
nigrum, *Linn.* . . 411
orientale, *Poir.* . . 410
rubrum, *Linn.* . . 411

Page
villosum, Wall. . . 410
Robergia hirsuta, Roxb. 28
Robinia candida, Roxb. 111
ferruginea, Roxb. . 246
fruticosa, Roxb. . . 109
Heynei, Wall. . . 261
macrophylla, Roxb. . 108
mitis, Linn. . . . 240
pygmæa, Linn. . . 116
racemosa, Roxb. . . 105
sennoides, Roxb. . . 110
suberosa, Roxb. . . 110
uliginosa, Willd. . 241
Rosa, *Linn.* 363
alba, *Linn.* . . . 364
anserinæfolia, *Boiss.* 365
Banksiæ, *Br.* . . . 364
bracteata, *Wendl.* . 364
centifolia, *Linn.* . . 364
chinensis, Jacq. . . 364
damascena, *Mill.* . 364
Eglanteria, *Mill.* . 364
Fortuneana, *Lindl.* . 364
fragrans, Redouté . 364
gallica, *Linn.* . . 364
glandulifera, Roxb. . 364
Hoffmeisteri, Kl. . 366
indica, *Linn.* . . . 364
inermis, Roxb. . . 364
involucrata, *Roxb.* . 365
Lindleyana, Tratin. . 365
Lyellii, Lindl. . . 365
macrophylla *Lindl.* . 366
microcarpa, *Lindl.* . 364
microphylla, *Lindl.* . 364
multiflora, *Thunb.* . 364
multiflora, Hb. Ham. 365
palustris, Buch. . . 365
Rapini, Boiss. . . 364
semperflorens, Linn. 364
sinica, *Ait.* . . . 364
sinica, Linn. . . . 364
sulphurea, *Ait.* . . 364
triphylla, Roxb. . . 364
Rosaceæ 307
Roseæ 308
Rotala apetala, F. Muell. 568
? *decussata*, DC. . . 569
filiformis, Hiern. . 568
myriophylloides, Welw. 572
Roxburghiana, *Wt.* . 569
verticillaris, Linn. . 567
Rothia, *Pers.* . . . 63
trifoliata, *Pers.* . . 63
Rourea, *Aubl.* . . . 47

Page
acuminata, *H. f.* . . 48
caudata, *Planch.* . 48
commutata, *Planch.* 47
concolor, *Blume.* . 49
dasyphylla, Miq. . 54
fulgens, *Planch.* . . 49
parallela, Planch. . 50
parvifolia, Planch. . 49
pulchella *Planch.* . 48
rugosa, *Planch.* . . 48
santaloides, *W. & A.* 47
sclerocarpa, W. & A. 51
similis, *Blume.* . . 49
sororia, Planch. . . 50
stenopetala, *H. f.* . 49
Rourea villosa, *Planch.* 48
Wallichiana, *Planch.* 49
Roureopsis, *Planch.* . 50
pubinervis, *Planch.* 50
Rubeæ 307
Rubus, *Linn.* . . . 326
acerifolius, Wall. . 329
acuminatus, *Sm.* . 327
affinis, Madden. . . 337
albescens, Roxb. . . 339
alceæfolius, Poir. . 330
alpestris, *Blume.* . 332
Andersoni, *H. f.* . 333
antennifer, *H. f.* . 337
asper, Don . . . 341
asper, Hb. Royle . 336
assamensis, *Focke.* . 328
betulinus, Don . . 327
bicolor, Jacq. . . . 366
biflorus, *Ham.* . . 338
bijugus, Focke. . . 339
birmanicus, *H. f.* . 331
Brunonii, Lindl. . . 367
calycinus, *Wall.* . . 327
Clarkei, *H. f.* . . 337
cæsius, L. 335
concolor, Royle. . . 335
concolor, Wall. . . 335
cordifolius, Don . . 330
discolor, Weihe & Nees. 337
distans, Don . . . 339
Eglanteria, Linn. . 366
ellipticus, *Smith* . 336
ellipticus, Wall. . . 337
Fairholmianus, Gar. 330
ferox, *Wall.* . . . 329
Finlaysonianus, Wall. 330
flavus, Ham. . . . 336
Fockeanus, *Kurz* . 334
foliosus, *Don* . . . 440
fragarioides, *Bert.* . 332

Page
fraxinifolius, *Poir.* . . 342
fruticosus, *Linn.* . 337
furfuraceus, Wall . 339
glomeratus, *Blume.* . . 328
Gowreephul, Roxb. 336
gracilis, Roxb. . . 335
Griffithii, *H. f.* . 327
Gulielmi Waldemarii, Klotsch. . 366
Hamiltoni, *H. f.* . 328
Hamiltonianus, Ser. 330
Hasskarlii, Miq. . 326
hexagynous, *Roxb.* . 327
hibiscifolius, Focke . 342
hirtus, Roxb. . . 336
Hoffmeisterianus, Kunth. & Bouché 342
Hookeri, *Focke.* . . 334
Hookeriana, Bertol. 366
Hookeriana, Wall. . 366
horridulus, *H. f.* . 341
Horsfieldii, Miq. . 339
hypargyrus, Edgw. 335
indicus, Heyne . . 339
indicus, Lesch. . . 328
insignis, *H. f.* . . 329
Ischelus, Hb. Ham. 339
Jacquemontii, Cress. 368
lævigatus, Wall. . 338
lanatus, *Wall.* . . 331
lasiocarpus, *Smith* . 339
lasiocarpus, Sm. . 340
Leschenaultiana, *Wight & Arn.* . 368
Lindleyi, Wall. . . 367
lineatus, *Reinw.* . 333
lobatus, Wall. . . 327
longicuspis, *Bertol.* 367
longifolius, Wall. . 339
lucens, *Focke.* . . 338
lutea, Mill. . . . 366
macilentus, *Camb.* . 336
macrocarpus, Gard. 330
macrocarpus, Kunz. 334
micranthus, Don . 339
micropetalus, Gardner . . . 330
moluccanus, *Linn.* . 330
Moorcroftii, Wall. . 368
moschata, *Mill.* . 367
mysorensis, Heyne . 339
niveus, *Wall.* . . 335
nutans, *Wall.* . . 334
opulifolius, *Bertol.* 340
oxyphyllus, Wall. . 327
paniculatus, *Smith* 329
paniculatus, Clarke 342
paniculatus, Moon . 336
paniculatus, Roxb. 342
parvifolius, Linn. . 342
? parvifolius, Moon . 339
parvifolius, Smith . 340
pauciflorus, Wall. . 339
pedunculosus, Don. 335
pentagonus, Wall. . 332
pimpinellifolia, H. f. & T. . . 366
pinnatus, Willd. . 341
pubescens, Roxb. . 367
pulcherrimus, Hook. 333
pungens, *Camb.* . 341
purpureus, *Bunge* . 337
pyrifolius, Ham. . 328
pyrifolius, H. f. & T. 328
racemosus, *Roxb.* . 340
? recurva, Roxb. . 367
reflexus, Ker. . . 330
reticulatus, Wall. . 331
rosæflorus, Roxb. . 339
rosæfolius, *Smith* . 341
rotundifolius, Royle 332
rotundifolius, Wall. . . 336, 337
Roxburghianus, Wall. 342
Roylei, Klotzsch . 340
rugosus, Smith . . 330
saxatilis, *Linn.* . . 333
sempervirens, H. f. & T. . . 368
sempervirens, Thory & Redouté 368
sempervirens, L. . 367
sericea, *Lindl.* . . 367
sessilifolius, Miq. . 336
sikkimensis, *H. f.* . 336
sikkimensis, Otto Kunze 341
sorbifolius, Maxim. 342
tetrapetala, Royle . 367
Thomsoni, *Focke* . 332
tiliaceus, Herb. Str. 331
tiliaceus, Sm. . . 329
torulosa, Wall. . . 366
Trentleri, *H. f.* . . 331
triflorus, Ham. . . 327
triflorus, Richards . 332
uncatus, Wall. . . 336
unguicularis, Bertol 366
Wallichianus, W. & Arn. 337
Wallichii, Sabine . 368
Wallichii, Trattin. . 367
Webbiana, *Wall.* . 366
Rumphia, *Linn.* . . 44
amboinensis, Linn. . 44
tiliæfolia, *Lamk.* . 44

SABIACEÆ 1
Sabia, *Coleb.* . . . 1
campanulata, *Wall.* 1
floribunda, Miq. . 5
lanceolata, *Coleb.* . 2
leptandra, *H. f. & T.* 2
limoniacea, *Wall.* . 3
malabarica, *Bedd.* . 2
paniculata, *Edgw.* . 3
parviflora, *Wall.* . 2
parviflora, Wall. . 2
purpurea, *H. f. & T.* 2
tomentosa, *H. f.* . 3
viridissima, *Kurz* . 3
Sagotia triflora, Walp. 173
Sambucus tiliæfolia, Wall. 748
Samyda piscidia, Ham. 593
SAMYDACEÆ . . . 590
Sanguisorba, see Poterium . . . 362
Sanicula, *Linn.* . . 670
elata, Ham. . . . 670
europæa, *Linn.* . . 670
hermaphrodita, Ham. 670
javanica, Blume. . 670
montana, Reinw. . 670
Sapindus microcarpus, W. & A. . . . 6
Saraca, *Linn.* . . . 271
arborescens, Burm. 271
cauliflora, *Baker* . 272
declinata, Miq. . . 272
indica, *Linn.* . . 271
Lobbiana, *Baker* . 272
macroptera, Miq. . 272
minor, Miq. . . . 271
palembanica, Miq. . 272
triandra, *Baker* . . 272
Zollingeriana, Miq. 271
Sarcopyramis, *Wall.* . 540
grandiflora, Griff. . 541
lanceolata, Wall. . 541
nepalensis, *Wall.* . 541
Saxifraga, *Linn.* . . 390
adoxoides, *Griff.* . 401
aristulata, *H. f. & T.* 392
asarifolia, Sternb. . 390
aspera, Willd. . . 397
aurea, Jacq. . . . 397
brachypoda, *Don* . 396
Brunoniana, *Wall.* . 397
Brunonis, Wall. . 397

Page
cernua, *Linn.* . . 390
ciliata, *Royle* . . 391
cordigera, *H. f. & T.* 391
corymbosa, *H. f. & T.* 393
diapensoides, Kurz. 398
diversifolia, *Wall.* . 393
evolvuloides, Wall. . 396
filicaulis, *Wall.* . 396
fimbriata, *Wall.* . 396
flagellaris, *Willd.* . 397
glandulifera, Jacq. . 395
glandulosa, Wall. . 396
granulata, Linn. . 390
hemisphærica, *H. f. & T.* 394
hirculoides, *Dcne.* . 392
Hirculus, *Linn.* . 392
Hirculus, H. f. & T. 393
hispidula, *Don.* . . 396
Hoffmeisteri, Klotz. 397
imbricata, *Royle* . 394
Jacquemontiana, *Dcne.* 395
latiflora, *H. f. & T.* 392
ligulata, *Wall.* . 398
? *ligulata*, H. f. & T. 398
Lychnitis, *H. f. & T.* 391
Lysimachoides, Kl. . 393
micrantha, *Edgw.* . 394
microphylla, *Royle* . 395
Moorcroftiana, Wall. 393
mucronulata, *Royle* 397
myosotifolia, Pall. . 397
nutans, *H. f. & T.* . 393
odontophylla, *H. f. & T.* 390
odontophylla, Wall. 390
oppositifolia, *Linn.* 397
pallida, *Wall.* . . 394
palpebrata, *H. f. & T.* 391
parnassifolia, Wall. 393
perpusilla, *H. f. & T.* 395
pilifera, *H. f. & T.* 397
purpurascens, *H. f. & T.* 398
radicans, Jacq. . . 397
ramulosa, *Wall.* . 395
saginoides, *H. f. & T.* 392
setigera, Pursh. . 397
sibirica, *Linn.* . . 390
sibirica, Linn. . . 390
Stella aurea, *H. f. & T.* 395
stenophylla, *Royle* . 397

stenophylla, Royle 397
Stracheyi, *H. f. & T.* 398
strigosa, *Wall.* . . 393
umbellulata, *H. f. & T.* 395
viscidula, *H. f. & T.* 391
Wallichiana, Sternb. 396
SAXIFRAGACEÆ . . . 388
Saxifrageæ 388
Scaligeria elata, Boiss. 673
meifolia, Boiss. . 673
Scaphespermum trilobum, Edgw. 694
Scandix, *Linn.* . . 692
Pecten Veneris, *L.* . 692
Schultzia, *Spreng.* . 697
? Benthami, *C. B. C.* 697
? *Lindleyi*, Wall. . 701
Sciadophyllum ellipticum, Blume 729
Scotanthus Porteanus, Naud. . . . 611
tubiflorus, Naud. . 611
Sedgwickia cerasifolia, Griff. 429
Sedum, *Linn.* . . . 417
adenotrichum, *Wall.* 420
adenotrichum, H. f. & T. . . 421
asiaticum, *DC.* . 419
azureum, Royle . 421
bupleuroides, *Wall.* 418
coccineum, Royle . 418
coriaceum, *Wall.* . 419
crassipes, Wall. . 419
crenulatum, *H. f. & T.* 417
elongatum, *Wall.* . 419
Ewersii, *Ledeb.* . 421
fastigiatum, *H. f. & T.* 419
Gerardianum, Wall. 421
Griffithii, *C. B. C.* . 421
heterodontum, *H. f. & T.* 417
Himalayanum, Wall. 418
Himalense, *Don* . 418
humile, *H. f. & T.* . 419
hypericifolium, Wall. 418
imbricatum, H. f. & T. 417
Jaeschkei, *Kurz* . 421
japonicum, Sieb. . 422
linearifolium, *Royle.* 420
Moorcroftianum, Wall. 422
mucronatum, Edgw. 420
multicaule, *Wall.* . 422

pallidum, *Bieb.* . . 421
paniculatum, Wall. 413
pauciflorum, Edgw. 420
perpusillum, *H. f. & T.* 422
pyriforme, Royle . 420
quadrifidum, *Pall.* . 418
Rhodiola, *DC.* . . 417
rosulatum, *Edgw.* . 420
rubrum, Royle . . 421
serratum, Thunb. . 417
sinuatum, Royle . 420
spinosum, *Thunb.* . 416
Stracheyi, *H. f. & T.* 418
tibeticum, *H. f. & T.* 418
trifidum, *Wall.* . . 420
trullipetalum, *H. f. & T.* 421
Urvillei, DC. . . 422
Wallichianum, *H. f. & T.* 419
Selinum, *Linn.* . . 699
Candollii, *DC.* . . 700
Candollii, Edgw. . 700
? *dissectum*, Wall. . 701
glaucum, Wall. . . 710
papyraceum, *C. B. C.* 701
stellatum, Don. . . 705
striatum, *Benth.* . 699
tenuifolium, *Wall.* . 700
vaginatum, *C. B. C.* 700
Sellowia uliginosa, Roth. 569
Semecarpus, *Linn. f.* . 30
acuminata, *Kurz* . 35
acuminata, *Thw.* . 33
albescens, *Kurz* . 35
Anacardium, *Linn. f.* 30
auriculata, *Bedd.* . 32
coriacea, *Thwaites* . 32
cuneifolia, DC. . . 31
Gardneri, *Thwaites* 33
Grahamii, Wt. . . 37
grandifolia, Wall. . 41
heterophylla, *Blume* 35
lævigata, *Thwaites* . 35
latifolius, Pers. . . 31
lurida, *H. f.* . . . 34
marginata, *Thwaites* 32
microcarpa, *Wall.* . 31
Moonii, *Thwaites* . 32
nigro-viridis, *Thw.* . 34
oblongifolia, March. 33
oblongifolia, March. 34
oblongifolia, Thw. 33, 34
obovata, *Moon* . . 32
obscura, *Thwaites* . 33
obscura, Thwaites . 33

Page
parvifolia, *Thwaites* 34
pubescens, *Thwaites* 31
subpanduriformis, *Wall.* 35
subpeltata, *Thwaites* 33
subracemosa, *Kurz* 35
Thwaitesii, *H. f.* . 31
travancorica, *Bedd.* 31
Walkeri, *H. f.* . . 33
zeylanica, Blume . 33
Sempervivum, *Linn.* . 422
acuminatum, *Dcne.* . 422
album, Edgw. . . 423
fimbriatum, Klotz. . 423
himalayense, Klotz. 422
mucronatum, *Edgw.* 423
sedoides, *Dcne.* . 423
Senna Absus, Roxb. . 265
alata, Roxb. . . 264
arborescens, Roxb. . 265
auriculata, Roxb. . 263
bicapsularis, Roxb. 263
dimidiata, Buch. . 266
esculenta, Roxb. . 262
exigua, Roxb. . . 265
obtusa, Roxb. . . 264
occidentalis, Roxb. 262
prostrata, Roxb. . 266
purpurea, Roxb. . 263
sensitiva, Roxb. . 266
Sophera, Roxb. . 262
speciosa, Roxb. . 265
sumatrana, Roxb. . 264
tenella, Roxb. . . 266
Tora, Roxb. . . 263
toroides, Roxb. . . 263
Serianthes, *Benth.* . 301
grandiflora, *Benth.* . 301
Serpicula, *Linn.* . . 431
brevipes, *W. & A.* 432
brevipes, W. & A. . 431
hirsuta, W. & A. . 431
hirsuta, Wight . . 431
indica, *Thwaites* . 431
indica, Thwaites . 431
veronicæfolia, Borg. 432
verticillata, *Roxb.* . 432
zeylanica, *Arn.* . . 431
Sesbania, *Pers.* . . 114
aculeata, *Pers.* . . 114
ægyptiaca, *Pers.* . 114
affinis, Schrad. . 115
cannabina, Pers. . 115
grandiflora, *Pers.* . 115
paludosa, Roxb. . 115
procumbens, *W. & A.* 115
sericea, DC. . . . 115
uliginosa, *Roxb.* . 115

Page
Seseli, *Linn.* . . . 693
ammoides, Jacq. . 682
benghalensis, Roxb. 696
daucifolium, *C. B. Clarke* . . . 693
indicum, *W. & A.* . 693
sibiricum, *Benth.* . 693
trilobum, *Benth.* . 694
zeylanicum, Rottl. . 684
Seselineæ 666
Sesuvium, *Linn.* . . 659
Portulacastrum, *L.* 659
repens, Willd. . . 659
Shuteria, *W. & A.* . 181
densiflora, Benth. . 182
ferruginea, *Baker* . 182
glabrata, W. & A. 182
hirsuta, *Baker* . . 182
involucrata, W. & A. 182
suffulta, *Benth.* . . 182
trisperma, Miq. . 181
vestita, *W. & A.* . 181
Sibbaldia cuneata, Edgw. 346
cuneata, Kunze . . 346
parviflora, Willd. . 346
potentilloides, Camb. 347
procumbens, H. f. & T. 346
procumbens, Linn. . 346
Sicyos oxyacanthus, Wall. 633
Sieversia elata, Royle 343
Sindora, Miquel . . 268
siamensis, *Teysm.* . 268
velutina, *Baker* . 262
Wallichii, *Benth.* . 268
Sison Ammi, Jacq. . 682
? *coniifolium*, Wall. 671
diversifolium, Wall. 681
? *tener*, Wall. . . 686
trinerve, Ham. . . 720
Sium, *Linn.* . . . 683
latijugum, *C. B. C.* 683
hipponicum, Maxim. 684
triternatum, Moon . 684
Smithia, *Ait.* . . . 148
abyssinica, Hochst. 149
aspera, Roxb. . . 151
bigemina, *Dalz.* . 149
blanda, Hohen. . 159
blanda, *Wall.* . . 151
capitata, *Dalz.* . . 150
capitata, Desv. . . 149
ciliata, *Royle* . . 150
conferta, Sm. . . 149
dichotoma, *Dalzell* . 150
geminiflora, *Roth.* . 149

Page
gracilis, *Benth.* . . 150
grandis, *Benth.* . . 151
hirsuta, Dalz. . . 151
hispidissima, Zoll. . 149
laxiflora, Benth. . 149
paniculata, Arn. . 151
pumila, Royle . . 150
purpurea, Hook. . 149
pycnantha, *Benth.* . 150
racemosa, Heyne . 151
sensitiva, *Ait.* . . 148
sensitiva, Wall. . 149
setulosa, *Dalz.* . . 149
Soja angustifolia, Miq. 184
hispida, Moench. . 184
javanica, Grah. . 183
Wightii, Grah. . . 183
Solenocarpus, *W. & A.* 27
indica, *Wt. & Arn.* 27
Sonerila, *Roxb.* . . 529
acaulis, Bedd. . . 538
affinis, *Arn.* . . . 533
amabilis, Kurz. . . 539
amabilis, *Triana* . 533
angustata, *Triana* . 536
angustifolia, Roxb. 537
arguta, *R. Br.* . . 537
Arnottiana, *Thw.* . 531
axillaris, Wight . 535
begoniæfolia, Blume 538
Bensoni, *H. f.* . . 540
Brandisiana, Kurz . 537
Brunonis, *W. & A.* 531
bullata, Griff. . . 540
elegans, *Wight* . . 535
elegans, Bot. Mag. . 534
emaculata, Roxb. . 537
erecta, *Jack.* . . . 530
firma, Thwaites . . 532
Gardneri, *Thwaites* . 532
glaberrima, Arn. . 540
grandiflora, *Wall.* . 535
Griffithii, *C. B. C.* . 539
Harveyi, *Thwaites* . 533
Helferi, C. B. Clarke 540
heterostemon, *Naud.* 540
hirsutula, *Arn.* . . 534
Hookeriana, *Arn.* . 532
khasiana, C. B. C. . 539
Kurzii, *C. B. Clarke* 539
Kurzii, Kurz . . 534
lanceolata, *Thwaites* 535
linearis, *H. f.* . . 536
maculata, *Roxb.* . 537
maculata, Rheede . 540
moluccana, *Roxb.* . 537
Naudiniana, Miq. . 541
nudiscapa, *Kurz.* . 539

Page

orbiculata, Lindl. . 534
paradoxa, Naud. . 538
pedunculosa, *Thw.* . 531
picta, Griff. . . . 537
picta, *Korth.* . . 536
pilosula, *Thwaites* . 584
pumila, *Thwaites* . 531
Rheedii, Wall. . . 538
rhombifolia, *Thwaites* . . . 533
robusta, *Arn.* . . 533
rostrata, *Thwaites* . 533
Rottleri, Wall. 530, 531
rotundifolia, *Bedd.* 538
scapigera, *Dalz.* . 538
secunda, *R. Br.* . 536
solanoides, Naud. . 534
speciosa, *Zenk.* . . 534
squarrosa, *Wall.* . 537
stricta, *Hook.* . . 530
tenera, *Royle* . . 530
tenera, Wall. . . 530
tenuifolia, *Blume* . 536
tomentella, *Thw.* . 531
travancorica, *Bedd.* 534
Wallichii, *Benn.* . 538
Wightiana, *Arn.* . 532
versicolor, *Wight.* . 535
violæfolia, *H.f.* . . 539
zeylanica, *W. & A.* . 500
Sonneratia, *Linn. f.* . 579
acida, *Linn. f.* . . 579
acida, Benth. . . 580
alba, *Smith* . . . 580
alba, Griff. . . . 580
apetala, *Ham.* . . 579
evenia, Miq. . . . 580
Griffithii, *Kurz* . . 580
lanceolata, Miq. . 580
mossambicensis, Kl. 580
? *neglecta*, Blume . 580
obovata, Miq. . . 580
Pagatpat, Miq. . . 580
Sophora, *Linn.* . . . 248
acuminata, *Benth.* . 250
alopecuroides, *Linn.* 250
glauca, *Lesch.* . . 249
glabra, Hassk. . . 249
heptaphylla, *Linn.* . 250
heptaphylla, Wight. 250
Houghiana, Wall. . 251
interrupta, *Bedd.* . 251
mollis, *Grah.* . . 251
Moorcroftiana, *Bth.* 249
robusta, Roxb. . . 252
tomentosa, *Linn.* . 249
velutina, Lindl. . . 249
violacea, *Thwaites* . 249

Page

Wightii, *Baker* . . 250
SOPHOREÆ 60
Sorbus Aucuparia, L. . 376
foliosa, Dcne. . . 376
foliosa, Wenzig. . 377
lanata, Wenzig. . 375
microphylla, Dcne. . 376
sikkimensis, Wenz. . 379
ursina, Dcne. . . 376
ursina, Wenzig. . . 376
Sorindeia Madagascariensis, DC. . . 7
Spatholobus, *Hassk.* . 193
acuminatus, *Benth.* . 194
crassifolius, *Benth.* 194
gyrocarpus, *Benth.* . 193
purpureus, *Benth.* . 194
Roxburghii, *Benth.* . 193
Sphæridiophora abyssinicum, Jb. & Sp. 92
linifolium, Desv. . 92
Sphærophysa pycnorhiza, Benth. . . 119
Spiræa, *Linn.* . . . 323
arcuata, *H. f.* . . 325
argentea, Loudon. . 326
Aruncus, *Linn.* . . 323
barbata, Wall. . . 389
bella, *Sims* . . . 324
brahuica, *Boiss* . . 326
callosa, *Thunb.* . . 324
callosa, H.f. & T. 324, 325
callosa, Wall. . . 324
canescens, *Don.* . . 325
canescens, *H. f. & T.* 325
cantoniensis, Lour. 326
chamædrifolia, L. ? 326
chamædrifolia, H. f. & T. 326
cœrulescens, Poir . 326
corymbosa, Roxb. . 326
cuneifolia, Wall. . 325
expansa, Wall. . . 324
fastigiata, Wall. . 324
Fortuni, Planch. . 324
glauca, Wall. . . 324
Kamtschatica, Lindl. 320
Kamtschatica, Wall. 323
laxiflora, Lindl. . 325
Lindleyana, Wall. . 324
micrantha, *H. f.* . 325
nepalensis, Lodd. . 326
nutans, Royle . . 326
parvifolia, *Bert.* . 325
pulchella, Kunze . 326
rhamnifolia, Wall. . 325
sorbifolia, *Linn.* . 324
stellata, Wall. . . . 324

Page

triternata, Wall. . 323
triternata, Wall. . 389
vaccinifolia, *Don* . 325
? *vaccinifolia*, Lodd. 326
venustula, Kunth. & Bouch. 326
vestita, *Wall.* . . 323
SPIRÆÆ 307
Spondias, *Linn.* . . 42
acuminata, *Roxb.* . 42
amara, Lamk. . . 42
axillaris, *Roxb.* . . 42
dulcis, *Willd.* . . 42
elliptica, Rottl. . . 23
macrophylla, *Wall.* 43
mangifera, *Willd.* . 42
simplicifolia, Rottl. 23
SPONDIEÆ 8
Stagmaria verniciflua, Jack. ? 25
Stracheya, *Benth.* . . 147
tibetica, *Benth.* . . 147
Stranvæsia, *Lindl.* . 382
glaucescens, *Lindl.* . 382
glaucescens, Dcne. . 383
Nussia, Dcne. . . 383
Stravadium *acuminatum*, Wall. . . 509
acutangulum, Miers 508
album, DC. . . . 507
augustum, Wall. . 509
demissum, Miers . 508
globosum, Miers . . 508
gracile, Miers . . 508
obtusangulum, Miers 508
Rheedei, Miers . . 508
rubrum, DC. . . . 507
rubrum, Wall. . . 508
Strongylocalyx hemisphericus, Blume. 477
Strongylodon, *Vogel.* . 190
ruber, *Vogel.* . . 191
Stylidium chinense, *Lour.* 743
Stylosanthes, *Sw.* . . 148
facie oxalidea, Wall. 174
mucronata, *Willd.* . 148
Styrax javanicum, Bl. 743
Suffrenia capensis, Harvey . . . 568
Swintonia, *Griff.* . . 26
Griffithii, *Kurz* . . 26
Helferi, *H.f.* . . 26
Schwenkii, *Teysm. & Binnend.* . . . 26
spicifera, *H. f.* . . 27
Sycopsis, *Oliv.* . . . 427
Griffithiana, *Oliv.* . 427

Page
Syndesmis, Wall. . . 22
Syzygium *alternans*, Miq. 500
altissimum, Wall. . 483
angkolanum, Miq. . 498
balsameum, Wall. . 499
Belluta, DC. . . . 485
brachiatum, Miq. . 496
calophyllifolium, Thwaites . . . 494
capillare, Wall. . . 478
caryophyllæum, Gn. 490
caryophyllifolium, DC. 499
caudatum, Wall. . 482
cinereum, Wall. . . 496
claviflorum, Wall. . 484
concinnum, Wall. . 482
cordifolium, Thw. . 491
corticatum, Wall. . 485
costatum, Miq. . . 498
cymosum, DC. . . 482
densiflorum, Wall. . 484
excavatum, Wall. . 484
ficifolium, Wall. . 497
filiforme, Wall. . . 478
firmum, Thwaites . 476
fruticosum, DC. . . 499
grande, Walp. . . 476
inophyllum, DC. . 481
Jambolanum, DC. . 499
Jambolanum, Thw. 499
laterifolium, Royle . 499
longiflorum, Wall. . 484
Michelii, Lam. . . 505
montanum, Thwaites 476
myrtifolium, DC. . 483
Neesianum, Arn. . 493
nelitricarpum, T. & B. 482
nervosum, DC. . . 498
nodosum, Miq. . . 498
oblatum, Wall. . . 492
obovatum, Wall. . 498
palembanicum, Miq. 476
Paneалla, Wall. . . 498
politum, Wall. . . 485
polyanthum, Thw. . 498
pulchellum, Wall. . 492
pyrifolium, DC. . . 487
rameum, Wall. . . 497
revolutum, Thwaites 492
ribesioides, Wall. . 496
rigidum, Wall. . . 487
rotundifolium, Arn. 494
rubicundum, W. & A. 495
salicifolium, Wall. . 495
spathulatum, Thw. 495

Page
speciosum, Wall. . 481
suavissimum, Wall. 484
sylvestre, Thwaites . 493
tetragonum, Kurz. . 497
vastum, Wall. . . 498
venosum, DC. . . 490
vimineum, Wall. . 482
Wightianum, Wall. 485
zeylanicum, DC. . 485

Tæniochlæna, *H. f.* . 54
Griffithii, *H. f.* . . 55
Talinum decumbens, Willd. 661
Tamarindus, *Linn.* . 273
indica, *Linn.* . . 273
occidentalis, Gaertn. 273
officinalis, Hook. . 273
Tapiria, *Juss.* . . . 28
hirsuta, *H. f.* . . 28
Taverniera, *DC.* . . 140
cuneifolia, Arn. . . 140
ephedroides, J. & Sp. 140
gonoclada, Jb. & Sp. 140
nummularia, *DC.* . 140
spartea, DC. . . . 140
Tephrosia, *Pers.* . . 110
amæna, Hort. Calc. 113
anthylloides, Hochst. 114
argentea, Pers. . . 113
argentea, Wight. . 114
calophylla, *Bedd.* . 111
candida, *DC.* . . 111
coccinea, Wall. . . 112
Colutea, Wight. . 113
diffusa, W. & A. . 113
Ehrenbergiana, Sch. 114
elegans, Wall. . . 112
fusca, *W. & A.* . . 114
galegoides, Grah. . 112
Heyneana, Wall. . 111
Hookeriana, W. & A. 113
hypargyræa, DC. . 111
icthynica, Bert. . . 110
incana, Grah. . . 113
indigofera, Bert. . 113
intermedia, Grah. . 112
lanceæfolia, Link. . 113
lanceolata, Grah. . 113
leptostachya, DC. . 112
lobata, Grah. . . 112
maxima, Pers. . . 113
Mitchellii, Grah. . 113
nervosa, Pers. . . 111
parviflora, Wight. . 113
pauciflora, *Grah.* . 114
pentaphylla, Grah. . 112

Page
Petersiana, Kl. . . 110
pulcherrima, Wight. 112
pulchra, Coleb. . . 105
pumila, Pers. . . 113
purpurea, *Pers.* . . 123
racemosa, W. & A. . 105
senticosa, *Pers.* . . 112
sericea, DC. . . . 110
spinosa, *Pers.* . . 112
stricta, Grah. . . 112
tuberosa, DC. . . 110
Taylorii, Grah. . . 112
tenuis, *Wall.* . . 111
tinctoria, *Pers.* . . 111
tinctoria, Grah. . . 112
timoriensis, DC. . . 113
villosa, *Pers.* . . 113
Wallichii, Grah. . 112
Teramnus, *Sw.* . . . 184
flexilis, *Benth.* . . 185
labialis, *Spreng.* . 184
mollis, Benth. . . 184
Terebinthacea, Wall. 24, 36, 37, 40
Terminalia, *Linn.* . . 443
alata, Roth. . . . 447
angustifolia, Jacq. . 444
angustifolia, Roxb. . 449
Arjuna, *Bedd.* . . 447
Aruta, Ham. . . . 446
Badamia, Tulasne . 444
belerica, *Roxb.* . . 445
bengalensis, Roxb. . 449
Benzoin, Linn. . . 444
Berryi, W. & A. . 447
bialata, *Kurz* . . 449
Catappa, *Linn.* . . 444
Chebula, *Retz.* 446, 447
citrina, *Roxb.* . . 446
coriacea, W. & A. . 448
crenulata, *Roth.* . 448
eglandulosa, Roxb. . 445
fœtidissima, *Griff.* . 445
gangetica, *Roxb.* . 446
Gella, Dalz. . . . 445
glabra, Dalz. & Gibs. 447
glabra, Thwaites . 448
glabra, W. & A. . 447
intermedia, Spreng. 444
lancifolia, Griff. . 454
microcarpa, Dcne. . 445
moluccana, Lamk. . 444
moluccana, Roxb. . 445
moluccana, Wall. . 449
monoptera, Roth. . 448
myriocarpa, *Heurck. & Muell.* . . . 448
Myrobalana, Roth. . 444

Page

nitens, *Presl.* . . 445
ovalifolia, Rottl. . 447
ovata, Herb. Rottl. 447
paniculata, *Roth.* . 448
parviflora, *Thwaites* 446
procera, *Roxb.* . . 444
punctata, Roth. . 445
pyrifolia, *Kurz* . . 448
reticulata, Roth. . 446
subcordata, Willd. . 444
tomentella, *Kurz* . 446
tomentosa, *Bedd.* . 447
tomentosa, W. & A. 447
travancorensis, W. & A. 449
trioptera, Heyne . 448
zeylanica, *Heurck & Muell.* 446
Tetracrypta cinnamomoides, Gardn. & Champ. 442
Tetrameles, R. Br. . 657
Grahamiana, W. . 657
nudiflora, *R. Br.* . 657
rufinervis, Miq. . . 657
? *Thaspium foliosum*, Royle 689
Thermopsis, *R. Br.* . 62
barbata, *Royle* . . 62
inflata, *Camb.* . . 63
laburnifolia, Don. . 62
nepaulensis, DC. . 62
Thladiantha, *Bunge*. . 630
dubia, *Bunge* . . 631
Hookeri, *C. B. Clarke* 631
Tiarella, *Linn.* . . . 399
polyphylla, *Don* . 399
Tillæa, *Linn.* . . . 412
pentandra, *Royle* . 412
pharnaceoides, *Hochst.* 412
trichopoda, Fenzl. . 412
Tordyliopsis Brunonis, DC. . . . 713
TORDYLIUM 665
Anthriscus, Linn. . 718
? *Brunonis*, Wall. . 713
latifolium, Linn. . 719
Toricellia, *DC.* . . . 748
tiliæfolia, *DC.* . . 748
Torilis Anthriscus, Gmel. 718
elata, DC. . . . 718
japonica, DC. . . 719
Trachydium, *Lindl.* . 671
dissectum, *C. B. C.* 672
hirsutulum, *C. B. Clarke* 672

Page

novem-jugum, *C. B. Clarke* . . 672
obtusiusculum, *C. B. Clarke* . . 673
Roylei, *Lindl.* . . 672
Trachypodium, Hf. & T. 673
Trapa, *Linn.* . . . 580
bispinosa, *Roxb.* . 590
natans, *Linn.* . . 590
quadrispinosa, Roxb. 590
palmata, *Vis.* . . 732
quadrispinosa, Wall. 590
Trembleya rhinanthera, Griff. . . 523
Trevesia, *Vis.* . . . 731
insignis, *Miq.* . . 732
sundaica, Regel. . 732
Triactina, *H. f. & T.* 423
verticillata, *H. f. & T.* . . . 423
Trianthema, *Linn.* . 660
crystallina, *Vahl.* . 660
decandra, *Linn.* . 661
Govindia, Wall. . 660
hydraspica, *Edgw.* . 661
monogyna, *Linn.* . 650
obcordata, Roxb. . 660
obcordata, Wall. . 660
pentandra, *Linn.* . 660
pentandra, DC. . . 660
polysperma, Hochst. 661
sedifolia, Visian . 660
triquetra, Rottl. . . 660
Trichodia vareciformis, Griff. 600
Trichosanthes, *Linn.* . 606
anguina, *Linn.* . . 610
anguina, Wall . . 607
aspera, Heyne . . 606
bracteata, Kurz . . 607
cordata, *Roxb.* . . 608
cordata, Wall. 607, 608
cucumerina, *Linn.* . 609
cucumerina, Wall. . 611
cuspidata, Lamk. . 609
dicælosperma, *C. B. Clarke* . . 609
dioica, *Roxb.* . . . 609
dioica, Wall. . . . 623
? *Fatoa*, Ham. . . 611
fœtidissima, Jacq. . 627
glabrior, *H. f. & T.* 608
grandibracteata, Kurz 607
grandiflora, Wall. . 606
heteroclita, Roxb. . 606
himalensis, *C. B. C.* 608

Page

integrifolia, *Thw.* . 610
integrifolia, Kurz . 612
laciniosa, Klein . . 609
laciniosa, Wall. . . 606
lobata, *Roxb.* . . 610
macrosiphon, Kurz . 610
? majuscula, *H. f. & T.* . . . 608
multiloba, *Miq.* . . 607
nervifolia, *Linn.* . 609
officinalis, Wall. . 612
palmata, *Roxb.* . . 606
palmata, Wall. . . 608
pilosa, Wall. . . . 609
? reniformis, *Kurz* . 609
Russellana, Wall. . 617
tricuspis, Miq. . . 600
truncata, *C. B. C.* . 608
tuberosa, Roxb. . . 608
TRIFOLIEÆ 57
Trifolium, *Linn.* . . 86
fragiferum, *Linn.* . 86
indicum, Linn. . . 89
minus, *Smith* . . 86
officinale, Willd. . 89
pratense, *Linn.* . . 86
repens, *Linn.* . . 86
resupinatum, *Linn.* 86
unifolium, Forsk. . 103
venulosum, Royle . 86
Trigonella, *Linn.* . . 87
arguta, Visiani . . 87
brahuica, Boiss. . 87
cachemiriana, Camb. 88
corniculata, *Linn.* . 88
elatior, Sibth. . . 88
emodi, *Benth.* . . 88
esculenta, Willd. . 88
fimbriata, Royle . 88
Fœnum græcum, *L.* 87
gracilis, *Benth.* . . 88
geminiflora, Bunge . 87
hamosa, *Linn.* . . 88
himalaica, Wall. . 88
incisa, Royle . . 87
indica, Linn. . . 63
monantha, C. A. Meyer 87
nervosa, Kl. . . . 88
obcordata, Wall. . 88
occulta, *Delile* . . 87
orthoceras, Kar. & Kir. 87
pinnatifida, Cav. . 87
polycerata, *Linn.* . 87
pubescens, *Edgw.* . 88
rhytidocarpa, Boiss. 88
Trilobaria, *A. DC.* . 642

Page

Triplectrum radicans, W. & A. . . . 548
Tripodanthera cochinchinense, Roem. . 611
Tristania, *R. Br.* . . 465
burmannica, *Griff.* . 466
conferta, Griff. . . 467
Griffithii, *Kurz* . . 467
Maingayi, *Duthie* . 467
merguensis, *Griff.* . 466
sumatrana, Miq. . 466
Wightiana, *Griff.* . 466
Tristemma angustifolium, Blume . . 515
Tritheca pentandra, Miq. 569
Troostwyckia singularis, Miq. . . . 37
Tryphera prostrata, Blume 662
Tupidanthus, *H.f. & T.* 740
calyptratus, *H.f. & T.* 740
Turgenia latifolia, Hoffm. 719

Umbellifera, Griff. . . 687, 697
UMBELLIFERÆ . . 665
Umbilicus fimbriatus, Turcz. 416
luteus, Ic. 416
Oreades, Dcne. . . 416
radicans, Kl. . . . 420
spathulatus, H. f. & T. . . . 416
spinosus, DC. . . 416
spinosus, Turcz. . . 416
Uraria, *Desv.* . . . 155
alopecuroides, Wt. . 156
arborea, G. Don . . 156
campanulata . . . 155
cercifolia, Desv. . . 156
comosa, DC. . . . 155
cordata, Wall. . . 157
cordifolia, *Wall.* . 157
crinita, *Desv.* . . 155
desmodioides, Grah. . 156
hamosa, *Wall.* . . 156
hamosa, Wall. . . 156
lagopodioides, Wall. 156
lagopoides, *DC.* . . 156
lagopus, *DC.* . . 156
lanceolata, Grah. . 156
leptostachya, Wall. . 156
linearis, Hassk. . . 155
obcordata, Miq. . . 166
picta, *Desv.* . . . 155
picta, Wight . . . 155

Page

prunellæfolia, *Grah.* 157
repanda, *Wall.* . . 156
retrofracta, Wall. . 160
retusa, Wall. . . 156
? *styracifolia*, W. & A. . . . 170

Vachellia Farnesiana, W. & A. . . . 292
Vahlia, *Thunb.* . . . 399
Oldenlandiæ, DC. . 399
oldenlandioides, *Roxb.* 399
sessiliflora, Wall. . 399
silenoides, DC. . . 399
viscosa, *Roxb.* . . 399
Weldenii, Reich. . 399
Velaga globosa, Gaertn. 575
Vicatia, *DC.* . . . 670
coniifolia, *DC.* . . 671
millefolia, *C. B. C.* . 671
? Stewartii, *C. B. C.* 671
Vicia, *Linn.* 176
angustifolia, *Roth.* . 178
Bobartii, Forst. . . 178
benghalensis, *Linn.* 179
Cracca, Benth. . . 177
dumetorum, Benth. . 178
Faba, *Linn.* . . . 179
Griffithii, *Baker* . . 178
hirsuta, *Koch.* . . 177
luteola, *Benth.* . . 205
mollis, *Benth.* . . 177
narbonensis, *Linn.* . 179
pallida, *Turcz.* . . 178
pallida, Jacquem. . 178
peregrina, *Linn.* . 178
rigidula, *Royle.* . . 178
sativa, *Linn.* . . . 178
sepium, *Linn.* . . 179
sylvatica, Benth. . 178
tenera, *Grah.* . . 177
tenuifolia, *Roth.* . 177
tetrasperma, *Mœnch.* 177
VICIEÆ 58
Vigna, *Savi* 204
anomala, Walp. . . 205
brachycarpa, *Kurz* . 206
carinalis, Benth. . 206
Catiang, *Endl.* . . 205
dolichoides, *Baker* . 206
glabra, Savi . . . 205
lucens, *Baker* . . 207
lutea, *A. Gray* . . 205
opisotricha, A. Rich. 203
pilosa, *Baker* . . 207

Page

repens, *Baker* . . 205
retusa, Walp . . . 205
sinensis Endl. . . 205
vexillata, *Benth.* . 206
villosa, Savi . . . 205
Wightii, *Benth.* . . 206
Virgilia aurea, Lam. . 251
capensis, Lam. . . 251
Voandezia subterranea, Thouars . . . 205

Wagatea, *Dalz.* . . 260
spicata, *Dalz.* . . 261
Warea, *C. B. Clarke* . 612
Tonglensis, *C. B. C.* 612
Weihea, *Spreng.* . . 441
ceylanica, *Baill.* . 441
Wellingtonia, Meissn. 3
Winterlia uliginosa, Spreng. 569
Wisteria pallida, Dalz. & Gibs. . . 105
racemosa, D. & G. . 105
Woodfordia, *Salisb.* . 572
floribunda, *Salisb.* . 572
fruticosa, Kurz . . 572
tomentosa, Bedd. . 572

Xanthoxylon trifoliatum, *Linn.* . . 726
Xiphocarpus candidus, Hassk. 111
Xylia, *Benth.* . . . 286
dolabriformis, *Bth.* . 286

Zalcya decandra, Bm. . 661
Zanonia, *Linn.* . . . 633
cissoidea, Wall. . . 633
clavigera, Wall. . . 634
? *heterosperma*, Wall. 632
indica, *Linn.* . . 633
laxa, Wall . . . 633
pedata, Miq. . . . 633
sarcophylla, Wall. . 634
ZANONIEÆ 605
Zehneria, *Endl.* . . 624
Baueriana, *Endl.* . 624
cerasiformis, Stocks 630
connivens, Miq. . . 625
exasperata, Miq. . 624
Garcini, Stocks . . 630
hastata, Miq. . . 625
Hookeriana, *Arn.* . 624
mucronata, Miq. . 624
scabra, Hv. & Sond. 624
umbellata, *Thwaites* 625
Wightiana, Arn. . 633
Zornia, *Gmel.* . . . 147

angustifolia, Smith . 147
conjugata, Smith . 148
dictyocarpa, DC. . 147
diphylla, *Pers.* . . 147
disperma, Grah. . 141
gibbosa, Spanoghe . 147
graminea, Spanoghe 147
pulchella, Pers. . . 162
strobilifera, Pers. . 227
Walkeri, *Arn.* . . 148
zeylonensis, Pers. . 148
Zosimia, *Hoffm.* . . 717
absinthifolia, *DC.* . 717
orientalis, Hoffm. . 717
radians, Boiss. & Hohen. 717
Zozimia tragoides, Boiss. 712

LONDON : PRINTED BY
SPOTTISWOODE AND CO., NEW-STREET SQUARE
AND PARLIAMENT STREET

ADDENDA.

P. 307. Under Tribe III. **Spiræeæ,** insert:—

Seeds linear, testa membranous, albumen scanty or 0	7. Spiræa.
Seeds turgid, testa crustaceous, albumen copious	7*. Neillia.

P. 326. Before **8. Rubus,** insert:—

7*. NEILLIA, *Don.*

Perennial shrubs. *Leaves* alternate, simple; stipules large, deciduous. *Flowers* racemed or panicled, white. *Calyx* persistent; tube campanulate; lobes 5. *Petals* 5. *Stamens* 10 or more. *Disc* lining the calyx-tube. *Carpels* 1–5, free or connate ventrally; ovules few or many. *Follicles* coriaceous or membranous. *Seeds* few or many, turgid; testa crustaceous, albumen copious. —Distrib. Species 4 or 5, natives of the Himalaya, Java, N.E. Asia, and N. America.

1. **N. thyrsiflora,** *Don Prodr.* 228; stipules usually serrate, racemes slender panicled, bracteoles usually toothed, calyx silky. *DC. Prodr.* ii. 546; *Wall. Cat.* 698; *Hook. f. & Thoms. in Journ. Linn. Soc.* ii. 75. N. virgata, *Wall. Cat.* 7108. Adenilema fallax, *Blume Bijd.* 1121.

Central and Eastern Temperate Himalaya, alt. 5–8000 ft. Khasia Mts., alt. 5–7000 ft.—Distrib. Java.

A large shrub, with drooping slender leafy branches. *Leaves* 2 by 1½ in., ovate-cordate, 3-lobed; lobes shallow, acute, sharply irregularly toothed or serrate. *Panicles* 3–8 in. *Flowers* shortly pedicelled. *Calyx-tube* ⅓ in., base rounded; lobes shorter than the tube, lanceolate, acute, in fruit often clothed with long rigid gland-tipped bristles. *Petals* small, white, oblong or obcordate. *Fruit* inclosed in the calyx, of 1 carpel.

2. **N. rubiflora,** *Don Prodr.* 229; racemes solitary or shortly panicled, stipules and bracteoles usually quite entire, calyx tomentose. *DC. Prodr.* ii. 547; *Hook. f. & Thoms. in Journ. Linn. Soc.* ii. 75; *Wall. Cat.* 697.

Central and Eastern Temperate Himalaya; Nipal, *Wallich*; Sikkim, alt. 8–10,000 ft., *J. D. H.*

Very similar to *N. thyrsiflora* in foliage, but leaves usually more deeply lobed; inflorescence always much shorter, petals larger, and calyx tomentose.